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Upstream Public Engagement at the Zoo: The Durrell Wildlife Park Public Participation Meeting

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engaging the public in nature conservation



Figure 1: 'Animals through Human Eyes', painting by Lisa Sayles

**Upstream Public Engagement at the Zoo:
The Durrell Wildlife Park Public Participation Meeting**

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Forward

The Durrell Wildlife Conservation Trust is an international conservation charity with the mission of *saving species from extinction*. Since its establishment in 1959 Durrell has saved numerous species from the brink of extinction and has restored the habitats on which they depend. We now run more than 50 conservation projects in 14 countries. This direct conservation work is complemented by a well-established training programme which, to date has trained more than 3000 conservationists from 128 countries. The third pillar of our conservation efforts is represented by our wildlife park at our headquarters in Jersey. Through captive breeding and applied research the park supports our programmes in the field. The park also plays a role in providing a shop window into our conservation work worldwide to a visiting public.

As a conservation organisation, Durrell seeks to engage visitors to the wildlife park with our work and inspire them to consider how they could change the world for the better. Up to this point we have probably adopted a similar approach to other zoos in trying to achieve this ideal by *telling* the visiting public what *we* think *they* should hear, in the way *we* think they should hear it, in order to *make them* change. Such a one-way process is unlikely to ‘engage’ or ‘inspire’ people to make a difference in wildlife conservation. Rather we need to open up our thinking to inviting publics into more of a two-way dialogue about how best we can engage and involve visitors on terms that make sense to them.

The Public Participation Meeting, held at the wildlife park in Jersey in October 2010, heralded a fundamental change for Durrell in how we engage and inspire our diverse public(s). The meeting provided us with an opportunity to bring together a cross-section of our visiting public to ask them what *they* think are the most important messages to be conveyed and how *they* think visitors should be engaged. By empowering this group to participate directly in decisions over the content, medium and location of Durrell Wildlife Park’s engagement and communication activities and materials, we have been able to gain valuable insights into what different sections of the public are looking for and how best to engage them.

With more than 180,000 people passing through our gates each year we have a substantial opportunity to engage publics with the wildlife conservation. Globally more than a tenth of the world’s population passes through zoos annually. Zoos therefore have a significant role to play in engaging and inspiring people to care for the world into which we have been born. The public participation meeting on which this report is based takes an important step towards changing the way we engage our public with this vital issue. After all, who better to determine how to engage our public most effectively than members of that public?

Jamieson A. Copsey
Head, International Training Centre
Durrell Wildlife Conservation Trust

**Upstream Public Engagement at the Zoo:
The Durrell Wildlife Park Public Participation Meeting
Dr Eric Jensen (e.jensen@warwick.ac.uk)**

Executive Summary

This report describes key findings from a series of concurrent focus groups comprising the Durrell Wildlife Park - Public Participation Meeting (PPM). This PPM is part of the larger European Commission-funded project *EU-Zoos-XXI*, which will see other PPMs taking place at zoos across Europe in Portugal, Sweden and Rome. The aim of these PPMs is to engage with members of the zoo visiting public and understand the kinds of educational and engagement needs they would like to see addressed by zoos. This unique approach involves engaging publics upstream in the decision-making process, and empowering them to guide the development of the zoo's educational provision.

Although the PPM participants focused primarily on defining the development of the Durrell 'Demonstration Project', the PPM focus groups also offer important insights into visitor interests, priorities and engagement preferences. This report presents both specific educational interventions identified as desirable by participants and general principles of visitors' engagement interests and needs revealed through in-depth, systematic analysis. The results show that in terms of message content, participants advocated a focus on the inter-connectivity of life on Earth, alongside the provision of details about the scope and details of Durrell Wildlife Conservation Trust's efforts to redress negative impacts on endangered wildlife. An unexpected rationale for the latter focus was to make Durrell Wildlife Park a 'see-through zoo' that is transparent in its goals, actions and impacts. This transparency was viewed as important for justifying admission costs, as well as demonstrating the legitimacy of the organization its requests for donation and further support from visitors in seeking to promote wildlife conservation.

The Durrell PPM had three constituent focus groups. Their suggestions for new engagement activities or materials in the wildlife park are summarized below.

A key principle advocated by participants was that unattractive or 'boring' surfaces should be covered with attractive visuals wherever possible around the zoo.

Group 1 advocated the following developments in the interests of enhancing the zoo's engagement:

- Providing more direction for visitors to the zoo, such as a suggested route and suggested activities, as well as generally enhancing signposting around the zoo.
- Introducing a full programme of animal keeper talks.
- Providing audio guides in different languages with the facility to provide information along certain routes through the zoo.
- Increasing the provision of 'all weather' areas to allow visitors to more fully engage in wet weather conditions.
- Enhancing the interactivity options in all areas.
- Making backstage areas open to view through windows so the public can see how things are done behind the scenes.

- Use communication technology to show currently unseen aspects of Durrell's conservation work, for example, showing endangered animals being released into the wild after a successful breeding programme.
- Using audio guides to enhance the immersive experience as well as relating key information in particular zones of the wildlife park.
- Develop long-term feedback relationships with visitors using electronic evaluation methods (e.g. asking visitors questions by email or Twitter).
- Connect zoo engagement to the opportunities for visitors to get involved, including through donations, animal adoptions, etc.

Introduction: Upstream Public Engagement at the Zoo

The conclusions of the UN Intergovernmental Panel on Climate Change (2007) are clear: Global production of hydrocarbons must be curtailed to limit the dramatic loss of plant and animal life already underway. Human behaviour and unsustainable consumption patterns are playing a significant role in escalating both climate change and biodiversity loss. While new green technologies and EU and national government initiatives are making a difference, the socio-cultural dimensions of these ever intensifying problems must be effectively addressed as well. Given the myriad economic, social and political barriers, pro-conservation social change needed (cf., Fisher et al. 2007). One set of institutions seeking to engage EU publics about the panoply of dangers currently threatening biodiversity in general, and wildlife in particular, is Europe's zoos and aquaria. Zoos and aquaria direct funds gathered from the hundreds of millions of visitors who enter their gates every year to contribute to programmes designed to save endangered species. Moreover, zoos claim to serve a vital educational and engagement role in persuading publics of the importance of conservation and involving them in this cause. For example, the European Association of Zoos and Aquaria (EAZA) states that their membership "empowers European citizens to learn about and contribute to global biodiversity conservation goals. It is estimated that more than 140 million people visit EAZA members each year, equivalent to approximately one in five European citizens" (www.eaza.net). Thus, European zoos see themselves as being at the frontier of public engagement with conservation and a drive for social change to help make the EU a more sustainable community of nations.

Yet, despite the scale of European zoos public engagement activities, it remains largely unclear what pro-conservation messages visitors think zoos should be communicating to their visiting publics and how. This lacuna in knowledge about visitors' perspectives on zoo-based public engagement and education is the *raison d'être* of the Durrell PPM. The Durrell PPM and the EU-Zoos-XXI project more generally aim to engage publics in dialogue to understand their perspectives on zoo-based education and engagement. In addressing this aim, the Durrell PPM was designed to take account of the latest theoretical and empirical literature on public engagement with science to ensure the highest quality public dialogue and participant satisfaction with the experience. This section of the report briefly outlines how science engagement is currently defined within European academic and policy literature, as well as the principles of good practice in public engagement that were adopted for the Durrell PPM.

Although there have been a range of visitor studies conducted in zoos and aquaria, this project represents the first ever example of 'upstream public engagement' in zoos, wherein the results of a rigorous and systematic engagement exercise feed directly into specific and visible action in a way that fully empowers the publics engaged. The core principles of such

upstream public engagement are to be transparent in the decision-making process, to be clear with participants about the scope of their input and how it will be taken forward, as well as ensuring that their views are fully analysed and included (not cherry picking feedback based on decisions already made about the form and content that developments will take prior to the public engagement activity). Prior research on public engagement with science has demonstrated that the crucial factors here are avoiding the appearance of institutional arrogance and demonstrating to participants that the engagement exercise will directly shape outcomes. Conversely, prior research clearly demonstrates that insincere public engagement in which all the decisions are predetermined can lead to greater frustration and more negative outcomes than no public engagement at all.

Public Engagement with Science

In the last two decades, discussions about ‘scientific and environmental citizenship’, and the need for ‘engagement’ between the sciences and the public have gained greater acceptance within government and institutional policy and practice in Europe (e.g. Irwin 1995; Irwin 2001; Wilsdon and Willis 2004). For many years the dominant approach to ‘public understanding of science’ has been the ‘deficit model’, in which greater ‘scientific literacy’ is viewed as the remedy for any public disinterest or distrust of scientific institutions or resistance to areas of scientific research and action. In recent years however, this ‘deficit’ model of public understanding has been eclipsed in social scientific and European policy discourse by calls for a two-way dialogue between sciences and publics. This new perspective posits that publics have a range of important forms of knowledge that they can contribute to enhancing decision-making (e.g. Wynne 1996)¹ on science-related issues (though not on the technical aspects of the science itself necessarily). Research Councils and professional organisations such as the Royal Society and British Science Association have joined high-level government officials in declaring a commitment to facilitating active public involvement in science-related issues (Irwin 2006). Notable in this regard is the 2000 UK House of Lords report on *Science and Society*, which concluded that “direct dialogue with the public should move from being an optional add-on to [...] become a normal and integral part of the process” (House of Lords Select Committee on Science and Technology 2000: 43). A wide range of institutions are currently involved in delivering on this ambition for greater science engagement with publics. Amongst these, zoos are particularly well placed to engage publics with conservation biology and the pressing issue of wildlife conservation on a grand scale.

Science Engagement and European Zoos

Zoos’ engagement activities in Europe take place within the context of broader goals of engaging publics with science. Indeed, the European Commission (EC) supports ‘public engagement with science’ through its FP7 ‘Science and Society’ funding stream, including the *EU-Zoos-XXI* project.

The terms ‘science engagement’ or ‘public engagement with science’ are used in this report to refer to any communication about scientific or technical topics involving science-related experts, stakeholders and citizens. Within this field, well-established practices aimed at ‘public understanding of science’ (PUS) have long sought to ‘educate’, ‘inspire’ and ‘inform’ publics through, for example, zoos and museums. Within a PUS framework, communication is characterised as one-way; that is, from the sciences (‘experts’) to the public (‘non-experts’). In

¹ Wynne, B. (1996). May the sheep safely graze? A reflexive view of the expert–lay knowledge divide. In S. Lash, B. Szerszynski, & B. Wynne (Eds.), *Risk, environment and modernity: Towards a new ecology* (pp. 44–83). London: Sage.

sociologist Alan Irwin's (2008) taxonomy of public engagement approaches such a closed-ended framework is defined as 'first order'.

Given the importance of scientific citizenship for European publics and the need to understand new scientific phenomena, it could be argued there is a strong social need for effective first order science engagement. Indeed, prior research in this domain at the Cambridge Science Festival and ZSL London Zoo (Jensen 2009; Jensen 2010) suggests that visitors can find a substantial level of value in first order engagement activities. However, there is also reason to suggest that greater dialogue with members of the publics being engaged would benefit the effectiveness of such practice for the benefit of both zoos and publics.

The particular argument informing the approach taken in the Durrell Wildlife Park Public Participation Meeting (PPM) has been articulated by policy analysts at the thinktank Demos and sociologist Brian Wynne, amongst others. Their contention is that public engagement should be 'upstream'. The idea is that engagement can be used to directly shape and improve the decisions made by a scientific organisation.

From a substantive perspective, engagement processes aim to improve the quality of decision-making, to create more socially robust scientific and technological solutions. The goal is to improve social outcomes in a deeper sense than just improving the reputation of the technology, company or government involved. From this point of view, citizens are seen as subjects, not objects, of the process. They work actively to shape decisions, rather than having their views canvassed by other actors to inform the decisions that are then taken. (Wilsdon & Willis, 2004: 39).²

The argument is that "public engagement must be substantive. It must not just inform decisions – it must shape them" (*Ibid.*, p. 39). Such upstream public engagement requires institutions to open up decision-making to be led by public perspectives rather than by solely expert or practitioner perspectives. This approach was advocated in a *Nature* editorial as follows.

There are good reasons why scientists should ignore these fears and embrace upstream engagement [...]. Upstream engagement [...] is worth doing – provided that all involved consider two points before beginning. First the process must be long-term and properly funded. [...Second,] organisations must make a genuine commitment to react to the results of engagement processes. (*Nature* 2004)³

In seeking to expand the past paradigm for zoo-based public engagement to allow for a more visitor-centred and upstream approach, the Durrell PPM drew upon the accumulated knowledge and research literature on public engagement with science, as well as broader theoretical and empirical perspectives from the social sciences. The methods employed in the Durrell PPM are described below.

² Wilsdon, J., and Willis, R. (2004). *See-through science: Why public engagement needs to move upstream*. London, Demos. Available from: <http://www.demos.co.uk/publications/paddlingupstream>.

³ 'Editorial: Going Public', *Nature* 431, (7011) (21 Oct 2004)

Methods

Overview

Three extended focus groups were conducted concurrently within the wider structure of a day-long Public Participation Meeting at Durrell Wildlife Park conducted in late October 2010. These focus groups gathered the perspectives of Durrell visitors, young and old, to inform the subsequent development of a 'Demonstration Project' incorporating participants' ideas within new engagement activities and materials. The PPM began with discussion of criteria for prioritising a particular area of the zoo for enhancing its public engagement value. Once criteria were identified and agreed upon, participants ranked four key zones in the zoo according to their agreed criteria. These rankings resulted in the selection of one zone (the Reptile and Amphibian House) as the focus for development as the 'Demonstration Project' for the *EU-Zoos-XXI* project. The remaining discussion centred first on positive and negative aspects of the current Durrell engagement and education provision. Next, the specific ways in which the Reptile and Amphibian House could be better used to engage publics with wildlife conservation were discussed in detail. The interwoven structure of the broader PPM group decision-making and the smaller focus group discussion can be seen in the PPM timetable below.

Table 1: PPM Timetable

<u>Time</u>	<u>Activity</u>	<u>Plenary / Group Level</u>
09:30	Pre-PPM unguided zoo visit (optional)	Plenary
11:00	Brief welcome to participants	Plenary
11:05	Brief self-introductions by participants	Group Level
11:20	Introduction to project and key areas of conservation science, priority education messages for Durrell	Plenary
11:45	Introduction to zoo education presentation	Group Level
12:10	Break	Plenary
12:15	Guided tour of four key zones in the wildlife park	Plenary
13:00	Break and pick up lunch and coffee	N / A
13:15	Ground rules for the focus group discussions (explained by facilitators)	Group Level
13:25	Focus groups: Identify selection criteria for educational opportunity zones	Group Level
	Groups narrow their criteria for zone selection to 3 per group	Group Level
13:50	Focus groups rejoin plenary, where final 3 criteria agreed for all	Plenary
13:55	Handout to be distributed with zone list. Participants rank individually on 3 agreed criteria. Highest scoring zone based on criteria is announced and taken forward for further discussion	Plenary
14:15	Break	N / A
14:25	Discussion of the most and least effective aspects of current Durrell educational materials and directions for improvement (to inform next item on agenda)	Group Level

14:55	Participants to develop at least one specific, actionable educational activity, signage, communication, materials, etc. for zone (Focussed Activity)	Group Level
15:55	Groups briefly feed back on what they have come up with to each other	Plenary
16:10	Debrief and reminder of invitation to attend follow-up focus group to help us refine details of message framing and phrasing, etc.	Plenary
16:25	End.	Plenary

PPM and Research Design

Given this is the first upstream public engagement project of its kind ever conducted within zoos or aquaria, the design of the PPM was based on the public engagement with science literature and relevant social science. As discussed above, key principles of upstream public engagement include:

- Members of the public actively shape decisions.
- Public engagement must be substantive. It must not just inform decisions – it must shape them.
- The process must be long-term and properly funded.
- Organisations must make a genuine commitment to react to the results of engagement processes.

A long-term commitment to shaping Durrell's public engagement around the results of this event can be seen in (1) stating clearly at the end of the PPM would happen next, (2) follow up communication with participants after the PPM, (3) bringing back a subset of participants to be involved in the development of specific context and framing for new education and engagement activities and materials and (4) inviting all participants to return later to see the Demonstration Project and give their feedback.

Figure 3: Participants given pre-PPM evaluation questionnaire as they arrive



Within the overall PPM structure, relatively conventional focus groups took place, but with 'focussed activities' designed to draw out specific ideas from participants while at the same time revealing fundamental principles underlying these specifics (see Jensen & Holliman, 2009). Due to the groundbreaking nature of this research, the focus groups included highly open-ended elements to explore respondents' perceptions in a relatively unconstrained manner to limit the risk of closing down useful but unforeseeable lines of response (see Jensen & Holliman, 2009).

Yet, at the same time, the broader structure of the PPM required a series of 'decision points' wherein participants prioritised certain aspects of their engagement interests and needs over others. Given resource limitations, only one 'zone' within the zoo could be selected for full upgrading of engagement materials or activities. To minimise the risk of intractable disagreement about which zone should be selected and how the educational provision in that zone should be developed, the broader PPM design drew upon key insights from conflict management theory. This approach was used to both minimise the risk of conflict and to ensure that the PPM experience was not stressful or unpleasant for participants.

In particular, the PPM was structured to follow the key precepts of Fisher et al.'s (1991) classic conflict management model designed to ensure constructive 'win – win' discussions, which can be summarised in the following points:

1. *Separate the People from the Problem*
Frame the discussion as a problem-solving task, not as a question of personal commitments that inevitably bring emotional complications and limit open discussion.
2. *Focus on Interests not Positions*

Keep participants from taking hard positions about *what* they want; instead focus on *why* they want this. This focus on interests opens up creative discussion of how core interests can be most effectively met rather than foreclosing on specific positions early in the process.

3. *Mutual Options for Mutual Gain*

Avoid the natural tendency to favour one's own ideas and desires, rather than creatively and openly discussing a range of alternatives). Fisher et al. identify the following barriers to identifying mutually beneficial solutions, which the PPM design sought to overcome:

- a. Premature judgement (avoid by defining the issue at hand)
- b. Limited focus on finding a single answer (avoid by emphasising plural discussion and creative decision-making)
- c. The assumption of a fixed pie (avoid by emphasising broad thinking and multiple approaches to achieving goals)

4. *Use Objective Criteria*

Avoid a 'battle of wills' by using objective criteria. A key advantage of collectively developed and selected criteria is that these then become a lever of non-coercive persuasion)

- a. Envision the issue as a mutual pursuit for appropriate objective criteria.
- b. Encourage discussants to be both reasonable and open to rational persuasion about which criteria are selected and how they are applied.
- c. Keep focus on core principles and criteria.
- d. It is strongly advisable to agree on the objective criteria that will be used before getting into the specific details of the argument at hand. This can help focus all participants on the criteria and emphasise that this will be a rational process, not one based on force of will.

These principles were fully incorporated into the PPM structure with the aim of facilitating a constructive decision-making process that would not bog down into intractable disagreements.

Figure 4: Behind-the-scenes Tour in Durrell PPM



Participants

Although their words have been anonymised in this report, we would like to acknowledge the participation of the following individuals in the Durrell PPM.

Table 2: PPM Participants

Maureen Bull
Sally Ann Langham
David Rocklin
Louise Bennett-Jones
Ryan Gabison
Louise Eden
Jordan Eden
William Henry Glynn
Kathryn Manning
Molly Perchard
Nina di Meo
Susie Gaukroger
Carol Gaudion
Mark Kevlin
Dawn Booley
Stephen Le Quesne
Additional participants requested their names not be published

Data Collection

The Public Participation Meeting was comprised of three focus groups, which were facilitated by Dr Eric Jensen (University of Warwick), Professor Steve Yearley (University of Edinburgh) and Jamie Copsey (Durrell Wildlife Conservation Trust). The overall management and organisation of the event was run by Dr Eric Jensen and Jamie Copsey.

The selection of a focus group approach was based on the need to gather a range of views through discussion to inform the selection and content of the Durrell Demonstration Project. Sociologist Erving Goffman (1961) explicated the methodology of focus groups under the synonym 'focused gatherings', defining them in terms of their "single cognitive focus of attention; a mutual and preferential openness to verbal communication...an eye-to-eye ecological huddle" (Goffman 1961: 18). Kitzinger and Barbour (1999, pp. 4-5) extend this definition:

Focus groups are group discussions exploring a specific set of issues. The group is 'focused' in that it involves some kind of collective activity - such as [...] debating a set of questions. Crucially, focus groups are distinguished from the broader category of group interviews by the explicit use of interaction to generate data. Instead of asking questions of each person in turn, focus group researchers encourage participants to talk to one another: asking questions, exchanging anecdotes, and commenting on each others' experiences and points of view.

Thus, if the structure and purpose of focus groups are carefully designed, they have the potential to facilitate analysis of the similarity and diversity of opinions on a particular issue from a variety of research participants (Kitzinger, 1994). Indeed, they were selected as the research method for the initial study because they allow a number of participants to discuss a particular issue – their perspectives on zoo-based public engagement with wildlife conservation– in a supportive environment, using their own language and terminology (Holliman, 2005).

Taking place at a formative stage to shape the Durrell Demonstration Project, the PPM focus groups for this study encompassed three main goals:

- *Research*: To investigate participants' views about zoo-based public engagement in order to inform the development of more effective approaches to communicating wildlife conservation messages.
- *Action (Demonstration Project)*: To identify the functionality and types of zoo-based informational resources and engagement that participants might value.
- *Public Engagement Methodology*: To assess the usefulness of conducting upstream public engagement in general (and a particular methodology in particular) to inform the development of new approaches and messages for engaging visitors with wildlife conservation.

The findings from this PPM phase of the project directly inform the subsequent structure, content and delivery methods to be used in the Durrell Wildlife Park Demonstration Project in the summer of 2011.

The PPM and each focus group session within it was digitally recorded and fully transcribed for analysis. Once collected the data were coded following an inductive or 'grounded' thematic analysis approach.

Figure 5: Durrell PPM focus group in progress



Data Analysis

An analysis of the focus group transcripts identified an array of specific recommended engagement activities and materials that Durrell Wildlife Park could undertake. These ideas are important to capture, both for the partner zoos involved in *EU-Zoos-XXI* to consider, but also as a potential source of inspiration for the broader international community of zoo educators.

The in-depth qualitative data collected during the focus groups were also rigorously analysed to identify patterns and themes (for full discussion of data analysis methods used, see Jensen & Holliman 2009). The results of this thematic analysis are presented primarily in the 'Results: General Principles' section below.

Qualitative results extracts from the focus groups are appended with a respondent's: gender and a number to distinguish individuals (e.g. F3 means 'Female Participant Number 3'), as well as the number designation of the focus group.

Results

Although the impetus for the focus group discussions in the Durrell PPM is specific to Jersey and to Durrell Wildlife Park, many of the wide-ranging suggestions and themes raised by participants are highly relevant to other zoos across Europe and overseas. The full range of general themes, specific recommendations for the wildlife park as a whole and particular developments advocated for the PPM's selected zone are all analysed and explicated in this report. This begins with specific recommendations for the wildlife park and the selected zone,

before moving to an explication of themes in participants' perspectives on zoo-based public engagement with wildlife conservation.

Suggested Developments for Full Park

Group 1 summarised its key recommendations for enhancing engagement and education at Durrell Wildlife Park as follows:

- F2 [We would like] a map but also more direction, like with a [suggested] route [through parts of the zoo] or something. More signposts. A programme of keepers' talks and guidance on how to take them all in whilst you are here. To guide you [with a suggested order]: one, two, three, four, whatever. Audio guides as in headphones with different languages with the facility to go by a certain route and to pause it [...]. All weather areas. More advertising, as in free promotional work on the radio, etc. Advertise all feeding times [to visitors].
- F1 I think that would be very good, because of the children especially.
- F3 More interacting in all areas. Or 'more interaction' I should put, shouldn't I? [Backstage] preparation areas open to view through window so the public can see how things are done behind the scenes. Advertise the expense of feeding the animals [to be more transparent with visitors] and promote the adoption of animals [i.e. donations], make people more aware of [animal adoptions]; maybe [give adopters the opportunity to] get up close to the animal you've adopted, as an incentive to adopt. Encourage more [local] volunteers [at the zoo] especially in the education area. [Provide] workbooks for children as part of the entrance fee.

PPM Group 1

In this report, these recommendations and others are explored in depth for their implications that apply across Durrell Wildlife Park and beyond. This analysis begins with very specific recommendations for new engagement infrastructure, signage and activities across the wildlife park.

Introduce Night Vision Goggles around Nocturnal Animals' Enclosures

In order to make the experience of visiting the darkened enclosures at Durrell more exciting, while improving the animals' visibility for visitors, it was suggested that night vision goggles could be made available.

- M2 Where the giant jumping rats are, and the aye-ayes are, in those kind of small buildings, I think they are hard to see.
- F1 I've got an idea. You know the aye-aye, where you can't see anything really? Why don't you offer night vision goggles? [...]. Because, so you can, so people can actually see it. Mostly they're just looking for it, like can I see it. Oh, they go, oh no, it's just a twig.
- M2 I would find that quite good fun.

PPM Group 2

Although this suggestion would require some level of capital and maintenance expenditure, it has the benefit of improving visibility with no impact whatsoever on the animals and their welfare.

Deliver Short Messages around Overarching Theme

In order to communicate Durrell's core pro-conservation messages effectively, it was suggested that Durrell should use short messages with vivid images arranged around a larger pro-conservation theme running throughout the site. In particular, the all-weather canvas posters that Durrell Interpretation had recently put up in a section of the wildlife park on the way to the Reptile and Amphibian House was cited as a good example because of their bold images of animals and large font.

- M2 Did I see those flag things on the lawn just then, just have a gorilla on or something like that, just for the basic information, just something like that, but more of them dotted around the zoo, like a picture of the animal and a fact.

PPM Group 2

The development of a clear theme within particular zones was identified as an area of Durrell Wildlife Park messages that had already shown improvements.

- M2 They are improving though, like the designs outside the main forest. They are getting a general theme, so they are improving. Again, I think it's a lot to do with cost.

PPM Group 2

This discussion suggests the idea of not trying to impart too much information through any one sign, but rather building some core pro-conservation points over the full duration of the visit in order to encourage repeat visits and continued interest in visiting the Wildlife Park.

Maintaining Interest through Rotating Themes

One specific suggestion for bringing in visitors was the introduction of theme days in order to encourage repeat visits and continued interest in visiting the wildlife park.

- F1 I've got an idea, why don't they do a theme day, where we have different themes every month or something, because then it will use, we'll have a day where loads of people come in, and that's...

- Mod What kind of themes?

- F1 Maybe Halloween theme, Christmas theme.

- M2 All the meerkats could wear little sun hats.

- F1 Or St. Patrick's Day.

PPM Group 2

Thus, themed activities were seen as a way of enhancing visitor interest by linking to well-known holidays.

Podcasting

Although technology-oriented suggestions were not a main focus in the PPM focus groups, one recommendation in the younger age focus group was to introduce a podcast as a method of engaging publics with wildlife conservation.

- M2 I know the zoo has webcams and it has a website. Does it have a podcast?
- EJ I don't think so.
- F2 Would there be enough information to have a podcast? 'The frogs are feeling-'
- M2 It would be to do with their projects abroad as well. I know they do a member's new booklet, so something to basically accompany that.
- F1 That sounds interesting.
- M2 Exactly, that's why you do a podcast.
- F1 But, are they expensive?
- M2 Podcasts are free.
- F2 Do people listen to them? [...]
- M2 Yes, some of them, it depends. [...]
- M1 You know, for radio shows, they do a podcast, basically the radio show condensed into an hour or hour and a half.
- Mod You can download it and take it with you to play with an mp3 player.
- PPM Group 2

Yet, despite this podcast suggestion, participants ultimately concluded that having live volunteers engaging visitors is a higher priority than technological solutions such as podcasts, as the primary means of engaging publics with wildlife conservation.

- M2 If it's either you go for the podcast or you can go for the volunteer staff kind of guide?
- M3 I think volunteers would be easier than the podcasts. [...]
- F2 I'm not going to go to listen to the podcasts.
- M2 It would be a much better experience if you actually see someone there, who is able to answer questions.

PPM Group 2

Hence, technological solutions such as podcasts and television screens can be seen as most useful for achieving engagement goals that cannot be accomplished inside the zoo. For

example, these communication technologies extend the reach of conservation messaging by showing visitors important conservation work taking place off-site and animal behaviour that is unlikely to be displayed within the zoo.

Expand use of Interactive Exhibits

An important priority for the child-focus engagement available at the zoo was the provision of ‘interactive’ exhibits and activities that allow younger visitors especially to feel they are being more fully involved in the experience.

- F1 You know the park bit, where the critters are? You know that bit where you can put your head in and feel like a real animal. Like more of that would be good, but maybe more around the zoo.

PPM Group 2

Hence, interactivity was viewed as a key feature of keeping children involved and interested in zoo-based public engagement.

Figure 6: Focus group participant trying out interactive exhibit during PPM guided tour



Meet the Keepers!

Another suggestion was to provide regular schedule of audience-friendly public talks about Durrell Wildlife Conservation Trust’s workⁱ. It was argued that such a programme of public lecture / demonstration could help to engage the community more with the Trust and its work, combating a perception of the wildlife park as a ‘secretive’ organization.

- M2 Have more lectures in the theatre, more maybe speakers and that stuff, just to open up a bit more, because [the zoo] can be a bit secretive sometimes.

- F3 And, with the keeper talks thing, even if you're not actually having an organised, set talk, just if he was wandering around. If they're not behind the scenes, just making people aware that they can just go up to them, and ask loads of questions and stuff, and making the keepers more interactive with the public?

PPM Group 2

As can be seen in the extract above, communicating zoo staff's openness to discussing their conservation work and answering visitors' questions was seen as a way of showing that Durrell Wildlife Conservation Trust is being transparent (not secretive).

In essence, respondents favoured the use of a wide range of methods for engaging visitors with wildlife conservation and related concepts.

- F2 They should use every medium. [...] People are different, [...] so if they do all of these things, then they'll reach everyone, I suppose.

PPM Group 2

This call for pluralism in the zoo's engagement approaches can also be seen in the following extract from Group 3, in which the use of a range of media (both electronic and non-electronic) is seen as the most fruitful approach.

- M3 What we're saying is we want a range of approaches, apart from the talks. But if they're not there when you walk around, it's very much sort of literature [signs / literature]; it's not electronic. There's some practical stuff but you've got to have a lot more random approaches.

PPM Group 3

Indeed, participants were very creative about the media that could be used to deliver core conservation messages. Below, possible communication approaches are discussed, including a display board and more creative options including a comic strip and a flip book.

- F2 We need to make people more aware.

- F3 You're not.

- M3 You could probably do that on just one board, and tell it in some sort of pictures, somehow.

- F1 Or, story, you know when you have the pictures and then it all captures it?

- M3 Like a comic strip?

- F1 That's it, they could do that, or maybe for kids to read.

- M3 They could actually do, just for the zoo generally, a little comic strip that you can just take away for free at the end.

- F1 Or, maybe you can get it in the, they can sell those, they're like strawberry ships, where you get the comic strips, yes.
- M3 I was thinking of a little magazine.
- F1 Or, maybe a flip book.

PPM Group 2

As can be seen in the extract above, creative media for communicating pro-conservation messages were considered useful, particularly by the younger participants.

This advocacy for pluralism in communication methods aligns with current educational theory, and the specific options for implementing such pluralism can be seen in some of the specific suggestions identified below in the next section of the report.

Finally, as a point of development for the wildlife park overall it was suggested that the zoo embed mechanisms for giving visitors an opportunity to feedback into the zoo's engagement activities.

- F1 Maybe we could have a little clipboard, where people can comment on the animals, and they can just write something about the animals, and see what they say, so you can prove, or see what they like.

PPM Group 2

As an example of how this suggestion could be incorporated within the zoo, a large chalkboard could be provided at different points around the zoo with an open-ended prompt to visitors to contribute their thoughts. For example, prompts could include questions such as 'what do you love most about orangutans?'- or at the end of the zoo visit- 'what's your favourite animal at Durrell and why?'. With their ideas inscribed on a wall in the zoo, the visitor can then feel like their ideas have become part of the zoo itself. That is, they become part of the engagement activities of the zoo. Contributions could be photographed using a digital camera at the end of each day and uploaded onto the zoo's website so visitors would have an incentive to go onto the website and could be inducted into further pro-conservation engagement using this medium.

Below are some further recommended developments to enhance zoo education, summarised with an example quotation.

Table 3: Recommended developments

Category	Quotations from PPM Participants
<i>Make Zoo Visits More Weather-Proof</i>	F3 All weather areas are useful aren't they, because while a lot of it is outside, on the viewing platform to the... where was it? I can't remember.
	F1 You mean all weather places to stand?
	F3 I mean viewing stations, like where the lemurs were was under cover.

Category	Quotations from PPM Participants
	<p>F2 I mean you can't do that everywhere. Then people are less put off by "oh, it's raining, it's all outside so we can't see anything".</p> <p>PPM Group 1</p>
<i>Focus Engagement around Animals that are the Most Endangered in the Wild</i>	<p>F2 I think it would be good to choose the zone which had the best potential for looking at the worst impacts to wildlife. The over-population, the hunting, the deforestation, the lessened natural habitat.</p> <p>F1 I think deforestation is probably one of the biggest threats to the animals, reptiles. The forests are going [disappearing] in, which one was it? Mauritius was it? Where the habitat was highly deforested.</p> <p>F3 And that's the whole [unclear] to all that's happening.</p> <p>F2 And what is there now, I mean we didn't see pictures of what was there, what they have now. I think they had fields of crops for themselves to eat but what about the animals that are left?</p> <p>PPM Group 1</p>
<i>Enhance multi-sensory experience in and around enclosures</i>	<p>F1 [My husband] is partially sighted and he can't see so perhaps there needs to be something [...] he would be able to relate to as he goes in [to the building. [...]] It needs to be all embracing as far as welcoming into the place, to make you think, oh, this is good!</p> <p>F3 Well, like the noises in the Kirindy Forest [enclosure] and the sounds of birds in [the] Jewels of the Forest [enclosure]?</p> <p>F1 Yes that was good.</p> <p>PPM Group 1</p>
<i>Provide more signs spelling out precisely how endangered particular species in the zoo are</i>	<p>F1 It is an [important] idea to have signs. Like, what was that one in Mauritius that was endangered?</p> <p>Mod The gecko, the lizard.</p> <p>F2 And the big bear. Now if you could put this is an extremely endangered species and the bear, there is only so many left. I mean the polar bear stands a good chance of going very soon, doesn't it? If people had something to grasp that they were really perhaps the last 50 pairs on the planet and then they would get that idea that that beautiful creature is no longer going to be there. Or that ugly little thing that probably gives off something very important for our own</p>

Category	Quotations from PPM Participants
	<p>lives – it would hit them. I think, I don't know whether that's a criteria or not. I don't think there is enough signage personally.</p> <p>PPM Group 1</p>
<i>Provide Specific Suggestions and Expanded Guidance for Both Adult and Child Visitors</i>	<p>Mod Do you have things for the children that, when they come in say, a workbook and then when they get around it keeps them focussed? 'Have you seen the animal in the enclosure?' and so they can have- then it is like a bible.</p> <p>F2 That's good for adults too, like a trial, this is a possible route you might want to go that way.</p> <p>F1 So that's going back to the [audio tour] headphones.</p> <p>PPM Group 1</p>
<i>Adapt Engagement to Children's Needs and Interests</i>	<p>F2 But that is good because that can be a big clientele for you and get into their little minds.</p> <p>F3 You need somebody who can talk to them at their own level without making them feel small.</p> <p>PPM Group 1</p>

Reptile and Amphibian House-Specific Developments

An important first step in re-developing the Reptile and Amphibian House to enhance its pro-conservation impacts is to more effectively attract visitor interest in the building.

- M2 You can change where the front sign is, where they say, Reptile Amphibian Centre, which is the green. I think if you change that, that'll help as well.
- PPM Group 2

Participants felt the exterior of the building should be made more visually appealing and simultaneously be used to raise visitors' interest in what they were about to see inside: namely, reptiles and amphibians.

- M3 You want to draw them in so that you can actually give them interest.
- F2 Pictures of animals on the outside, something that makes it look fun and exciting. It's very much a brick building, and until you have to go inside.
- PPM Group 2

Some participants favoured using vivid images of wild habitats for reptiles and amphibians while others favoured asking schoolchildren to contribute a mural to cover the wall on the exterior of the Reptile and Amphibian House.

- M3 A mural.
- M2 Like you've got at the Kirindy Forest, that sign which is blue sky with a picture of a forest and you've got something a bit like that.
- Mod It sounded like Louise is interested in completely obscuring the brick, so that it's all.
- F2 Yes, it's boring, maybe put animals, like reptiles outside. Make it green maybe.
- M3 Get some school kids to do it.
- F2 Anything that's going to make it, draw attention to [the Reptile and Amphibian House].
- M2 Signs, and then you've got the signage at the front as well, outside, to change the look of the Reptile and Amphibian House from the outside.
- F2 Give it some colour.

PPM Group 2

In this vein of broadening public interest in the conventionally less charismatic animals residing in the Reptile and Amphibian House, participants identified this project as an opportunity to involve members of the community and give them a sense of co-ownership of the wildlife park. This discussion first centred on the aforementioned building exterior.

- F2 Stuff on the outside could be done quite easily. You know by the Rice Bowl in St. Clements, they, someone, I don't know who it was, a group of kids or something, they did that painting on the white wall.
- M2 You can get graffiti artists or something to do it.
- F2 Yes.
- M2 Do it as a community project.
- M3 If school kids do it, then they'll be invested [in the wildlife park].
- M2 They'll want to come back, because you're giving a bit of ownership to them.
- F1 And, they can have the little pictures there- [...]
- M2 Yes.

PPM Group 2

In practice, any or all of these ideas could be incorporated into various exterior walls around the Reptile and Amphibian House. The main principle advocated by participants was that

unattractive or 'boring' surfaces should be covered with attractive visuals wherever possible around the zoo.

Key Messages / Content

Participants advocated a complete overhaul of existing signage in the Reptile and Amphibian House. The aim of this overhaul was for the information in the Reptile and Amphibian House to more effectively communicate the important work that Durrell does to address wildlife conservation problems worldwide.

- M2 I'd change the current signage as well. [...] It's inadequate. [...] There's nothing about Durrell's work there. Nothing at all. They say they're the first to breed the mountain chicken or whatever, but that's it. They don't say what they do, why they do it, what their current programmes. There's nothing like that. There's no relevant, up to date information.
- F2 Because we changed the layout of it, you could also add the story, to go along around maybe, so it could be Durrell's journey or something. Do something like that.

PPM Group 2

As can be seen in the discussion above, an important step for participants discussing how best to re-develop the Reptile and Amphibian House's educational provision was to decide what the core messages would be. They indicate above that one such message should be the nature of and rationale for Durrell Wildlife Conservation Trust's conservation programme relevant to this zone of the zoo.

Group 3 focused on using the Reptile and Amphibian House to inform visitors about the full process of Durrell's conservation activities within the domain of reptiles and amphibians.

- M4 So what we're saying is that we think the Reptile and Amphibian House is a great opportunity for getting the core message across because it particularly enables us to tell a full story from behind the scenes to growing your own cockroaches [to feed the animals], to dealing with the actual process getting the animals back into the wild and so on. So to express that along the way, we have identified a whole range of techniques that would not just be one directional [...], but we would use as many media processes as we could. And obviously there's a scale issue, and there's a cost issue and so on. So that would have to be worked out. But that would include as many interactive activities as you could possibly manage.

PPM Group 3

The use of communication technology was advocated for the Reptile and Amphibian House to display aspects of the Durrell Wildlife Conservation Trust's work that would not otherwise be visible to visitors.

- M4 We are very keen on using electronic [screens] for the story being told about the stuff behind the doors where you can't actually go, so you can at least see back there.

- M3 You can see it with the electronic programme that goes through [the full story of a Durrell conservation programme]. So you can actually see these chicken toads being released or whatever it is, even though it's behind this door. We're then saying we're trying to build on that experience through some kinds of feedback, which can either be- we're saying electronic in terms of asking questions of people on email or Twitter and that carries on all through. And we were thinking even more at this point you can then start also mixing the business with pleasure about how you get money out of that setup, and at this point would you like to contribute to this bit, adopt an animal and so on.
- PPM Group 3

At a much more fundamental level, an important focus for this discussion was that the information in the Reptile and Amphibian House needed to communicate the fact that animals on display there are endangered in the wild and why.

- M3 Okay, what is the core message? [...]
- F2 They are all endangered.
- F3 They're endangered, but [...] why is that a problem? How is that going to-
- M3 Like, the current amphibian crisis and why [it's happening]?
- M2 I think there should be quite a big thing about that, because that's huge.
- F1 Maybe you could tell them how endangered they are and what's happening to them and how they're being killed and...
- F2 Yes, and what they [Durrell] are doing about the fact that they're endangered.

PPM Group 2

In framing the problem of endangered reptile and amphibian species for visitors, the provision of relatable factual information about the scope of the crisis was also seen as important. One participant expressed this point as, "Give them the big statistics" (F1, PPM Group 2). Concomitantly, participants thought it was important to communicate the incredible scope of the effort required to address the problems of endangered species, and the lengths Durrell Wildlife Conservation Trust is going to in order to address conservation crises around the world.

- F2 There's so much stuff that goes on overseas, in just the various places. But I don't know if there's really that much information [i.e. the zoo] about all the projects that are going on outside the zoo.
- M2 I don't think people realise is how big Durrell is. I think that's quite a big problem.
- F1 Maybe you could have, you know those maps [showing Durrell's projects], it doesn't show how big it is, but maybe they can tell how big [Durrell Wildlife Conservation Trust] is on maps.

- F2 I think they can see.
- M2 [...] Yes, like you said, obviously you talk about what they do in country [with conservation programmes]. But then also there are things like their active breeding programmes. Mention them and what their successes are.
- M3 Basically the stuff at the back?
- M2 Yes.
- F1 How much they've got right now and what they hope to do.
- M2 Basically all the stuff that Jamie was saying in the back [during the guided tour], about the toad and the gecko?
- M3 Yes, the lesser something gecko, lesser Mauritian gecko, something like that.
- M2 That would cover information that no one really knows about, because it's all hidden away [backstage].

Engaging visitors with the scope of Durrell Wildlife Conservation Trust's work was viewed as a good way into broader science learning about the inter-dependence of different animal species.

- M3 I quite like the idea of them being able to explain or using the exhibits to explain more about conservation problems, like habitat and loss of that.
- F2 And, how that is affecting everything else. Because the whole idea of, if you lose one species, it's going to affect the whole food web. If you lose one, it's going to affect everything else. So although people might not like toads or insects and stuff, but if you lose them, then you're going to lose the bigger animals that people are more interested in.

PPM Group 2

Thus, in terms of content Group 2 thought the focus should be on the way in which the inter-connectedness of life on earth renders that conserving species large and small is important for all.

As can be seen in the extract below, Group 3 arrived at a similar content focus on 'inter-connectivity'. This discussion begins below with a reference to the *EU-Zoos* conservation science theme of 'ecological connectivity', which refers to the growing problem of habitat fragmentation.

- M3 I think what I've learnt from today that I didn't know about Durrell, I think I knew but it really hit home to me, is this word 'interconnectivity'. And they're talking about it for the animals. But I'm thinking about it as humans, about how I connect. I think that when we get these patches of animals not being able to get together, we've got human beings who are not connected with the

wildlife, and that connectivity [...]. And that whole story, you can take that story into the rainforest just as easily, the interconnectivity.

F2 As with any animal.

M3 But, for me, what has really hit home is what the work here is and that's the bit when you say, 'how can we engage our visitors?'. That's what it's about. [...]

F2 And the breeding.

M3 And the phrases coming to me from that, as I was walking round, so something I've used in other conservation things, 'what are you giving back?'.

F1 That's what I think.

M3 And so interconnectivity- so what are we giving back into this process? And my mind is running. I will be changing when I go back [after the PPM]. I'm going to change one of my charities and I'm going to switch it to here because I'm just thinking one of the things I've got isn't actually going the way it should go. This is what I believe in.

PPM Group 3

As can be seen above, messages about interactivity were seen as highly relatable for visitors considering their impacts on the natural world. Notably, such a core message could be used to communicate the issue underlying wildlife conservation problems across the zoo.

In addition, the idea of enhancing interest in amphibians by emphasizing their dangerous qualities was suggested much later in the focus group in discussion with the Assistant Curator for reptiles and amphibians at Durrell (designated D1 below).

M1 Just how poisonous are the poisonous frogs?

D1 That very much depends, as always. It depends on the species and it depends on the circumstances.

M1 I'm just trying to tie in my ideas with what was said about gory and messy being popular with visitors.

While on its face, this focus on how dangerous certain amphibian species may be seen as contradicting both the goal of saving animals and the larger theme of interconnectivity. Yet with some creative thinking, both of these topics can be addressed. In particular, the way in which the poison dart frog is adapted to its environment, as well as the relationship between these animals and the humans living around them.

D1 Now, with frogs, you're talking about around 60 species maybe and they all have quite a strong sting. But most frogs have some kind of a sting [unclear]; it makes sense because they live in warm, humid areas where there's lots of bacteria and fungi and all that, so they need to keep them off their equally moist skins. So all amphibians have some kind of a deterrent. Those poisoned dart frogs have a strong poison, and usually you can say the more colourful they are, probably a bit more toxic they are to predators or diseases. The

name, poison dart frog, comes from the Indians who brought their darts on those frogs and then shoot stuff. And that happens only with three species. Of all the ones that are called poison dart frogs, only three species are important enough and have been used.

- M3 One of those is the cane toad, is it?
- D1 No, the cane toad, no.
- M3 Because they're having problems in Australia with cane toads.
- D1 It's a very toxic animal but it has not been used as a dart gun and the toxin is not strong enough.
- M3 To eat a cane toad is poisonous.
- D1 Oh, yes, but the cane toad is big; it has a lot of venom. If you just rub a little bit on a dart, it wouldn't be strong enough to do anything.
- M3 Oh, I see.
- D1 Now, there are three species of poison dart frogs which have toxin strong enough. You just rub a little bit on and shoot. In a couple of seconds what it hits will be dead.
- M3 And are they in Durrell?
- D1 Yes, the yellow ones, the poison dart frogs, that's actually the most poisonous land invertebrate.
- M1 Is that on a notice in [the Reptile and Amphibian House]?
- F1 Yes, it is.
- M1 Do you tell them how much poison it would take to cause death?

PPM Group 3

Emphasizing the inherent danger associated with certain amphibians raises certain risks for the main message of encourage wildlife conservation as it may encourage the idea that these animals are a danger to humans and thus not worthy of conservation efforts. However, if this discussion of poison dart frogs, for example, makes clear how its dangerousness fits into the larger interconnectivity of species and their habitats, then this could be an interesting example case to use to illustrate this message.

Increase Proximity and Interactivity with Animals

There was a continually expressed desire to get closer to the animals and to limit the barriers between the visitors and the animals whenever possible. For example, the young child participant in Group 2 indicated that tours would be more 'fun' if they also included the opportunity to see some animals closer up.

F1 They could bring animals out. That's what they usually do, but they don't do it as often-

M3 Yes.

F1 Make it a bit more fun.

PPM Group 2

Indeed, within the bounds of animal welfare, there was an interest particularly from the child participant in having opportunities to get closer to the animals. One suggestion in this vein was to construct a bubble viewing point within the enclosure as is provided in many meerkat enclosures.

F1 The meerkat enclosure, where they have the little hole where you can just go under, yes? Why don't we have a bit like that, except in one of the enclosures, maybe the big enclosure, put one in the middle and see?

However, another respondent raised a concern about whether this could be accommodated with good animal welfare.

M2 I'm thinking that reptiles are much more prone to stress and disturbance than meerkats, so there's a balance between giving people interaction, but also you've got to think about the animals at the same time.

PPM Group 2

The main point here is that greater proximity to the animals was desired to enhance engagement within the Reptile and Amphibian House.

Touch and Zoo Education. Indeed, this finding of a desire for closer proximity to animals links to the suggestion that touch could be usefully integrated through the use of models of reptiles and amphibians that have a realistic feel.

F2 Can't really do taste or touch, you can do touch.

F3 Like for the, with the snakeskin, I think that could be a good thing. I don't know how they would display it, but that's a good thing for kids to have.

Mod To touch the snakeskin?

M2 An interactive board or something.

F3 I know in [another zoo] they've got tortoise shells and stuff. [...]

F1 Not snakeskin, because it would be killing the animal.

M2 No, they shed their skin.

F1 Oh yes, okay, that's good.

Mod It wouldn't have to be a real skin, it could be...

F3 Something that feels real.

PPM Group 2

As can be seen below, it was argued that this touch experience could be educational as well as enhancing interactivity.

M2 How many people have ever touched a real frog?

F3 People are really surprised, they think they'll be all slimy but they're not, so I think that would be interesting.

M3 Having dead frogs around?

M2 No, obviously you get a taxidermist. Anyway. Yes, some kind of interactive.

Mod Where you get a chance to touch? [...]

M1 What have we got down then?

M3 So, touch snakeskin, or stuffed frog.

Mod Or a realistic model?

M3 Yes.

M2 More ethical.

M3 Way to go.

PPM Group 2

Group 3 also indicated interest in enhancing the provision of 'touch' opportunities. They also discussed the possibility of visitors touching animal-related objects, rather than the animals themselves.

M2 What about interacting when you can get them to rub an arrow on some sort of skin or something, a yellow-coloured skin or-?

M3 A plastic model maybe.

M2 Maybe, or a real lizard skin that you get from somewhere, from some animal that's been hijacked or kidnapped or something. Particularly seeing the alligators in the Caymans, they look absolutely gorgeous. They're just over there, but you can't touch them, you can't go anywhere near them. But if there was something close by that we could feel them or something?

This line of discussion about providing touch opportunities for visitors led to a brief ethical debate about using real skins or stuffed animals seized by Customs in order to provide a touch experience and communicate a conservation message.

- D1 Okay. The problem is, if they should feel real then you need to think that there are obviously legal issues with it. Because you would need a stuffed animal.
- M1 [...] I mean, hundreds of animals are hijacked or kidnapped and transported across borders every single day.
- F2 Yes, so that should be an argument against it.
- M1 No, you get one and say this is what happens to animals and we're going to make use of it. The poor thing is already dead so let's make use of it.

PPM Group 3

As can be seen in the extract above, the mixed feelings about using a real animal skin was not resolved. The key issue is whether an animal skin or taxidermy animal would make a greater impact in terms of imparting a message about the problems with animal poaching for example, or whether their use is too distracting from the main message. Prior research at ZSL London Zoo has indicated that the distraction level for children is high with real animal skins, suggesting that an artificial model of some kind would be preferable if it can be made to feel like an animal or fur.

Need for Active Presentations in Reptile and Amphibian House

Participants indicated their interest in having live presentations delivered in the Reptile and Amphibian House by knowledgeable staff capable of enthusiastically answering visitors' questions about the animals. This was seen as making a "bigger impression" than written information.

- M3 I was just, I think that having, I'm a bit lost there, having the information presented verbally to say, have more tours and have people who come into do the tours, and have different little chats outside the Reptile and Amphibian House or whatever, more frequently throughout the day. I think that will interest people a lot more than having signs. And you can get more information into a verbal presentation, and you can get them to listen to them more than you can get them to-
- M2 It's more because then they ask questions and stuff. It should be quite easy to get the training together and put some advertising about if anyone wants to do the tours. [...]
- F2 I think the member of staff thing is obviously good to do, because obviously they're the people who are going to be enthusiastic and so it's all very well reading information, but I think if someone, even if it's exactly the same information that's written, if someone is enthusiastic about it, tells it to you, it's going to make such a bigger impression on you.

PPM Group 2

Thus, participants valued the provision of live presentations by zoo staff. The obvious link here is to provide live presentations linked to the behind-the-scenes tour that was universally

Behind-the-Scenes Tour

In line with the tour they received as part of the PPM, participants felt publics would benefit from a tour of the breeding and feeding activities going on behind the current public view of the Reptile and Amphibian House.

- M2 Maybe they could do guided tours of the back as well, but then you need permission of the staff.
- M3 I was saying that a staff tour should be more featured, because that sort of thing, presumably they've got a schedule where it's 'feed the chameleons at this time', and if there's just a short period where there's nothing really going on, except food preparation, and someone could be spared, then you could advertise at the front, 'at this time, there is the opportunity to have a quick look around'.
- M2 We should talk to the [staff] first, obviously. [...]
- F2 You definitely need to do something with the back [area], because there is so much work going on behind there. So I think guided tours would probably be the way to do that, but you wouldn't want massive groups of people wandering through. You'd want it to be-
- M2 Maybe five people at the most or something.

PPM Group 2

The group was asked towards the end of the focus group whether they were still committed to a guided tour as a priority. At this point, the practical constraints on the provision of behind-the-scenes tours were discussed.

- Mod Did you still want to do guided tours of the back of the Reptile and Amphibian House?
- F2 You definitely need to do something with, out in the back, because there is so much work going on behind there. So I think guided tours would probably be the way to do that, but it would be something like you wouldn't want massive groups of people wandering through. You'd want it to be...

PPM Group 2

Alternative and mediated options for delivering the same kind of content and behind-the-scenes visibility were discussed.

- F2 Maybe it's not tours behind the scenes, but get [staff] to tell [visitors] what's going on behind the scenes. Something like that, rather than actual tours.
- F1 Couldn't you have a TV [screen] that can show them what happens?

- F3 Maybe when you walk through the door, before you walk through the entrance, there could be a plastic thing where you pick up a quiz thing that you could fill in for the kids or something.
- F1 They already do that.
- F3 Or, even if the door to the kitchen is made into a glass door, or something so that you can see, because I remember there was that enclosure that you could see into the kitchen, so you can see them making food and stuff.
- M2 Make more of the ramp entrance, by putting a roof over it.

PPM Group 2

These options for making the backstage activities in the Reptile and Amphibian House visible were intended to ensure that all visitors could see these activities while reducing demands on staff.

Members of Group 3 debated whether following the ‘behind-the-scenes’ stories of Durrell’s conservation work in terms of the development of a breeding programme from start to finish could help to engender long-term interest. That is, might visitors become invested in the story of the breeding of the endangered animals and their ultimate release in the wild, returning to the wildlife park to follow their progress and then witnessing the animals’ release through video?

- M2 That might not bring people back to the zoo on regular visits; that might just be something they’ll enjoy once a year, you know. They might not say we must go to the zoo and see the animals being bred for feeding the animals.
- F3 Some people might just come back to see the breeding animals.
- M4 It might not be the thing to draw people back. We want to encourage people to come back more regularly because of the new improvement made here. That might not do that. It might be interesting for one time but not interesting every time you come to the zoo or you might not be drawn to the zoo because of it.

PPM Group 3

Regardless of whether it is realistic to expect repeat visits to follow the breeding programmes at Durrell, a number of practical constraints on the idea of behind-the-scenes tours were identified. Group 3 discussed practical limitations on the keepers’ time and other aspects of delivering the tour.

- F2 The keepers do great work in the Reptile and Amphibian House.
- M2 They have a lot of knowledge as well.
- F2 But how much do they want to be involved [in public engagement]? I think they need to be consulted as well, as to how much they want to be involved, how much it’s going to disturb their other work and how we can stop from doing that. Because it’s no good letting everyone behind the

scenes if actually it compromises that really important work behind the scenes. And so I think it has to be liaised with all the people.

PPM Group 3

In addition to the constraint of keepers' time, Group 3 also raised a concern about the fact that feeding only occurred at certain points in the day and therefore a large number of visitors wouldn't be able to benefit from the behind-the-scenes tour or from a display of food preparation and animal feeding as part of a 'keeper talk'.

M3 Isn't it going to be difficult to show the actual food, because it's only going to be at certain times, isn't it?

M2 They have to prepare it. They have to get the food ready in advance.

M3 Yes, but again that's only going to be a certain part of the day. Isn't this something that could be put on the display board?

M2 But could you display how they're bred, the insects, how they breed, how the reptiles- That could be displayed, how they're bred and how we do this in-house.

M3 Exactly, so you don't have to have the individual keeper-

M1 Yes, but people are more interested if there is a keeper-

M3 They do the talks now. They could have the talks show food preparations as well.

PPM Group 3

Given the practical constraints, alternatives to a conventional tour were also considered by participants, within the same general idea of giving visitors a window onto what goes on behind-the-scenes at the Reptile and Amphibian House.

F2 Maybe being able to see through into the back [of the Reptile and Amphibian House] or something? I'm not sure, because maybe it would be a bit disruptive to do the actual guided tours with a lot of people walking through the back, so if they could just see through and not actually go in?

M2 Have a glass door?

M3 Yes.

PPM Group 2

One aspect of their own tour behind-the-scenes of the Reptile and Amphibian House that participants found interesting was seeing the food that was cultivated and prepared for the animals. Of particular interest was the cultivation of insects for the reptiles and amphibians to eat.

- M3 I was like you, behind the scenes told the whole story and suddenly we have the organic- I know it might seem strange, but I found the concept of organic cockroaches quite interesting food for the reptiles-
- M2 Or the fact that somebody will actually breed them.
- M3 And it's a little bit special because you feel that you've gone behind the scenes and there's that little bit of extra interest.

PPM Group 3

Thus, there was widespread agreement about the value of seeing 'behind-the-scenes' of the Reptile and Amphibian House. However, there was disagreement about the precise way in which visitors could be given access to this backstage area most effectively and with the least disruption to the work of the keepers' and scientists' conservation work.

Volunteers Leading Reptile and Amphibian House Engagement. In order to enable more extensive engagement between Durrell staff and visitors at the Reptile and Amphibian House and elsewhere in the zoo, it was suggested that volunteers could be recruited from the local community.

- F1 Maybe we could ask for volunteers to do some talks? Or, we could get people to get up and ask them what they think of the animals and then be part of the talks? Yes, that would be good, because they could get more involved, and that would be interactive, so more people would want to come up.
- M2 That's the talks that I've been talking about, that would be done by volunteers.
- F1 Yes, you also have to focus on the reptiles, or maybe they can talk about the Reptile and Amphibian House and maybe we can put a bit more detail into the things, like the enclosures, or maybe just make [the Reptile and Amphibian House] a teeny bit bigger.

PPM Group 2

As can be seen in the discussion above, participants valued the greater interactivity that could be provided through having a great deal of personal interaction available to visitors.

- M2 The main idea, we would have someone in there, mainly during peak periods, depending on how many people they can have or what the money is like and basically have someone there for people to talk to. [...]
- M2 A general information point, yes.
- M3 Around if anyone has got any questions.

PPM Group 2

As can be seen above, participants felt having someone visitors could speak with about the animals was very important, while acknowledging that having paid staff enact this role may be prohibitively expensive.

Training the volunteers was also discussed by participants, as in the focus group extract below.

- M2 It doesn't really take that much time to educate someone on basic principles of what's happening out there, and if someone doesn't know they can say, "I'm sorry, I don't know, but you can check it here". You [i.e., the volunteers] don't have to know everything.
- F2 Because there's always going to be actual staff just two seconds away [in the 'behind-the-scenes' area], and they [the volunteers] can run in and ask quickly.
- M2 If [visitors] come to the talk, [the volunteers] can answer them [their questions]. It's just more of an interactive experience.

PPM Group 2

Notably, as can be seen in the discussion above, interactivity- not knowledge per se- was seen as the most important contribution of increased staff presence. However, there were specific messages that participants thought that volunteer educational staff could effectively enhance or expand upon for visitors.

- M3 What things they [the volunteers] need to know is what the names of the animals are, how old are they, what do they eat? What else?
- M2 A lot of it will be to do with the zoo's work, like what the zoo's doing. I think that might be quite a lot of what the questions will be directed at. Why have you got those animals in the zoo in the first place?

PPM Group 2

Thus, participants were able to identify anticipated domains of visitor interest covering the identities and characteristics of the animals and the zoo's related conservation work. Moreover, it is clear that the 'human touch' enabled by increased educational staff (albeit volunteer staff if necessary) was seen as a valuable direction for increased public engagement with wildlife and zoo-led conservation work.

Multi-Sensory Experience in Reptile and Amphibian House

It was emphasised that the Reptile and Amphibian House (and the rest of the zoo) should be seeking to engage multiple physical senses in visitors. As one respondent in PPM Group 3 said, "It's got to be a multi-sensual experience. You've got to have everything" (M3, PPM Group 3). Within this multi-sensory experience, the first and most important sense for the zoo to engage is the visual. Indeed, devising ways to ensure the visibility of animals in the Reptile and Amphibian House was identified as an important priority.

- M2 But, you see, one of the problems I see with that lizard, it is interesting but a lot of the times the animals are not very obvious. They're hidden a lot of the time. I think they ought to use modern technology.
- M3 Black screens.

- M2 That could actually show them in their natural habitat. Now, I think there's a connection and if you actually can see the animal, and then you can actually see it in its natural habitat at the same time, it's something more than BBC's David Attenborough. And you can get black screens.

PPM Group 3

Beyond the visual, sound was viewed as an important vehicle for communicating the connection between reptile and amphibian species and their habitats.

- F2 I like the hearing in the Reptile Room. You can hear the 'chck chck', I like that.
- F1 What are we going to write down?
- F2 Maybe they could do the sight and touch and smell in there, and you can look at it all.
- F3 I'm sure they could do something like snakeskin and stuff.
- F1 That's what I said.
- F3 That people actually touch and see.
- M3 Basically as many as possible.
- F3 Yes, all the senses.
- F1 Or, you can smell, well you can already smell it in the Reptile and Amphibian House...but maybe a bit more what they eat, dead mice and things.

PPM Group 2

Much later in the discussion, the group elaborated on how sound could be introduced into the visitor experience in the Reptile and Amphibian House in order to give the exhibit a more immersive quality.

- F2 Definitely like the audio side of it, like the sounds of the animals.
- M3 Because, it's quite hot and stuffy in there.
- F2 You could have a few fans.
- M3 I was thinking, they could put a bit of foliage around the place, and start playing, like trying to turn it into a bit of a rain forest, sort of thing.
- M2 They're doing that with the 'cloud forest' [zone].
- M3 That's what's given me the idea, but-

- F1 Maybe they can do a theme for that, with different places, so it doesn't get boring.

PPM Group 2

This idea of using sound to create a more immersive experience was further developed towards the end of the focus group.

- M3 Hide speakers in them telling you bits of-

- M2 Like in your enclosure, when you go in, there's rainforest sounds.

- F1 Yes.

- M3 You like that?

- M2 Yes. When you go inside the enclosure, there's the sound of the rainforest.

- M3 That sort of thing [...]. Just general rainforest, so you could have frogs going off and something howling, and some crickets going off.

- F1 And, then water.

- M3 A water or stream or something.

PPM Group 2

It was suggested further that these 'sounds of the rainforest' be connected to visual representations of the rainforest displayed through television screens.

- F1 Or, you could have a TV, showing what they look-

- F2 What it looks like in the wild.

PPM Group 2

Essentially, participants favoured a broad spectrum approach in which many methods of communication were employed to engage visitors with wildlife conservation.

- M2 Right, so basically medium is as many as possible?

- F2 Yes.

PPM Group 2

Ambient Temperature. The ambient temperature of the Reptile and Amphibian House was also viewed as an opportunity for implicit educational provision.

- F1 At the moment, it's dirty and it's always wet, when people walk around, it's really hot in there as well.

- M2 It has to be, because reptiles...

- F1 Yes, but can't they close it up so the heat stays in the actual enclosures, instead of getting out?
- M3 There's that one enclosure, where it's open at the front.
- F1 I know, but if you have glass in there? [...]
- F3 I think it makes it quite good that it's warm, because it makes it more realistic, that's reptiles and that's the conditions they live in.

PPM Group 2

As can be seen in the extract above, the child participating in the focus group raised a concern about the heat of the Reptile and Amphibian House negatively impacting visitors' experience there, while the other group members saw it as a useful opportunity to connect visitors with the natural habitats and climates of the reptiles and amphibians housed there. The other side of the discussion was whether visitors would be uncomfortable as a result of the heat. Again, the other participants disagreed with the child on this point.

- F1 It's really hot, though.
- F3 It's not like you're going to be in there for hours, so it's not going to-
- F1 Some people are.
- F3 It would be quite nice, if you come in and if it's a [cold and rainy] day like this, and you go in and it's warm. So I think it's quite good that it's warm.

PPM Group 2

Thus, most participants saw the hot temperature in the Reptile and Amphibian House as a positive, although the child participant's concerns about the heat negatively impacting visitors may be worth investigating to see if it is worth including some strategically placed fans, for example, within the building.

Multi-Layered Interpretation

Participants advocated the development of different educational provision for different ages.

- M3 Target audience?
- F2 Everyone.
- M3 We need something for parents, children and adults, and young adults.
- F2 You need that.
- F1 All ages.
- M2 It [the educational provision's focus] could be split. But then say, we were looking at information, having information above the enclosures and information below the enclosures, because children are quite little, so you could have their information beneath, and then stuff for the adults above.

PPM Group 2

Indeed, Group 2 participants were keen to use the vertical space in the Reptile and Amphibian House by placing over-size life-like amphibian and reptile models on the wall space above the enclosures or even on the ceiling.

Group 2 elaborated this idea of using over-size statues of reptiles and amphibians, with one participant pointing to an example of such a statue within the classroom where the focus group was being held.

F2 Something like that would be cool [pointing to over-size statue of a frog at the top of the classroom wall], just frogs on the front or something.

M3 That's true.

Mod 3-D statues, I guess they are.

M2 Something that stands out. You've got the space for that as well. [...]

F2 You can put up information because they're pretty cool to look at, so if you're going to look at them, and then you could read the information.

M2 You could also open them up and explain the biology of the same time, but only very simply. You don't want to give them too much.

PPM Group 2

While not settling on the specific idea of using over-sized models of reptiles and amphibians visible in the Reptile and Amphibian House enclosures, Group 3 also suggested using the full vertical space to create maximum 'interest' for visitors.

F3 And there's a lot of interest. When you walk in those doors you've got a lot of interest around you, up and down.

PPM Group 3

As can be seen in the ideas expressed above, participants valued the use of creative approaches to engage visitors with wildlife biology and conservation.

Re-Structuring Reptile and Amphibian House Educational Provision

Ultimately Group 2 concluded that a clearer pathway should be established so that visitors were directed to go through the Reptile and Amphibian House in a one-way path. This would then allow for more control over the educational narrative, building up a story from general to specific over the course of the visit to the Reptile and Amphibian House. One means of providing guidance to visitors that was suggested was to have a painted snake on the floor showing a way through the building.

M3 You could have that sort of thing on the floor, like a snake that people have to follow around.

F1 Yes, or hopscotch for kids.

F2 Yes, interactive, a massive snake around and then you could have pointers along.

M2 And, it also makes the floor a bit colourful as well.

PPM Group 2

As another way to achieve a clearer pathway through the Reptile and Amphibian House, the group decided that a false wall should be placed in between the entrance and exit of the Reptile and Amphibian House.

M3 If there was a wall there, they're going to have to go [left]

M2 And, then that gives more area to put signs and stuff. [...]

M3 I don't mean to say a big wall, but something, like a big net, like one of those big poster things.

PPM Group 2

The participants continued by pointing out that this false wall could be populated with general messaging about the situation of reptiles and amphibians worldwide. This general story would then be giving more flesh to the stories of particular threatened species that could be viewed in the Reptile and Amphibian House.

M2 As you walk in on your right. [...]

M3 That would probably be a good place to put stuff about the amphibian...

M2 Yes, more general thing about amphibians and then put more specific to the species by their enclosure.

PPM Group 2

This change to the structure of the Reptile and Amphibian House was viewed as offering a low-cost means of enhancing the capacity for delivering educational messaging while at the same time helping to direct the flow of visitors so that they were all travelling around the Reptile and Amphibian House in the same direction.

M2 We could add a wall there, like a display.

M3 I'm thinking a loose, more natural wood trellis. Cheap as chips.

M2 And, put some information on there. Add information on there [...].

M3 You have a display, like 'amphibians in crisis' or 'the current state of amphibians' or something like that, so you can relate it to the rest of the world.

PPM Group 2

The new displays envisioned for the Reptile and Amphibian House would be used to communicate a conservation message linked to Durrell's work.

- M3 Trellis there [creating a new false wall at the entrance] with a poster on it.
- Mod What's on the poster?
- F2 Information.
- M3 Information. [...] That [false wall] is the first thing you'll see when you go in, so that could be the introduction to this snake trail [that runs around the building on the floor, providing a suggested pathway].
- M2 [The new wall should provide information about] Durrell and Amphibians, so the zoo- it means you're told why you're here in the first place.
- F2 And, something just general about- not a specific animal, but just the general work that they're doing with amphibians and a bit about stuff they're doing overseas as well, maybe. [...]
- M2 Like with the mountain chicken [frog].
- F2 Yes. [...]

PPM Group 2

Interestingly, as in other focus groups, the question of why endangered species should be valued by humans came up. That is, what is in it for us, humans?

- F2 Yes, and why they are needed.
- M2 I'm sure there's been some kind of medical stuff that's come out of studying amphibians, like certain chemicals from their skin and stuff like that. Just relevant stuff that people...
- F2 Which is why they're important.

PPM Group 2

While this question of animals' value for humans was raised across the PPM focus groups, however as can be seen above Group 2 felt it should be addressed immediately upon visitors' entry into the Reptile and Amphibian House. The follow-up details of conservation problems and how they can be tackled could then be developed over the course of the visitors' journey around the Reptile and Amphibian House.

Table 4: Reptile and Amphibian House-Specific Developments

Category	Quotations from PPM Participants
<i>Special e.g. 3D glasses that heighten the effect of surrounding materials in the Reptile and</i>	<p>F1 They could do a bit where they wear special specs, and you look to see a spider or something, they can-</p> <p>M2 Why would you want to see a spider? [...]</p>

Category	Quotations from PPM Participants	
<i>Amphibian House</i>	F1	To get a better view of the spider. PPM Group 2
<i>Camera to show live Behind the Scenes Activity</i>	M1	You could put mini cameras on the back?
	F2	I think that was good.
	F1	Yes, and then you can see the back. [...] Mini cameras in the back, to see what's [...]-
	M2	You generally see them quite well anyway.
	F1	Oh, sometimes you can't see anything back here, with the frogs. PPM Group 2
Have informational leaflet(s) for people to take away at the beginning and/or end of the Reptile and Amphibian House visit	M2	Leaflets?
	M1	Just have a little pocket thing by the door, as you leave, that you can read it, or at the beginning so that you can read it as you go around. PPM Group 2
Low Cost Expansions of Reptile and Amphibian House (add windows to tortoise enclosure and perhaps to outside of Reptile and Amphibian House so people can look in from outside to relieve crowding)	M2	I don't know what else they could do, apart from walking around [the Reptile and Amphibian House].
	F1	Expand it.
	M1	The Reptile and Amphibian House is quite small, and it could be a lot bigger. Then more people would go to see it.
	M2	Expensive to do that, though.
	F1	Maybe we could have a walkway to go around the outside of it.

Results: General Principles

In order to expand upon the specific recommendations made by participants in the course of the PPM event and focus group discussions, a full social scientific analysis of the focus group transcripts was undertaken. The aim of this analysis is to develop a more in-depth understanding of visitors' values, needs and interests relating to zoo-based public engagement with wildlife conservation. Given that this is the first project of its kind, this data analysis revealed patterns of visitors' educational interests and needs not previously established in the existing published literature on zoo visitors.

Prioritisation of Educational Provision

The first round of discussion focused on the basic principles upon which one would decide which part of the zoo to focus limited resources to enhance the zoo's educational provision. Given all zoos face limitations in the resources they can marshal in the interests of engaging publics with science and wildlife conservation, the decision-making rubrics identified by participants are of broad import.

This discussion fed directly into the larger PPM structure, in which the three groups' initial lists of prioritisation factors were narrowed to just three per group and then ultimately to three binding criteria for all groups to use.

Group 1 Criteria

Group 1 summarised their proposed criteria for prioritising particular zones within the wildlife park internally for their group members as follows:

- F3 Top criteria. I think there was the 'least visited' or the 'least popular'. [Also], the 'more endangered species'.
- F1 I don't think you can say which ones are most popular because different people in the group-
- F3 Well 'least visited'. [...]
- M2 Accessibility [is another criterion].
- Mod With that do you mean ease of getting to the enclosure or do you mean ease of viewing, seeing the animals?
- M2 I meant seeing the animals.
- F3 So 'viewing'. [...]
- M2 'More natural habitat for the animal'.
- F2 'Getting a good balance of animals and plants'.
- F1 [To display] biodiversity.

PPM Group 1

These proposed criteria for Group 1 were negotiated down to five. In the extract below, the five criteria from Group 1 are summarised.

- UF 'Least popular', the 'more endangered and level of threat', 'most natural for animals', 'which area most illustrates Trust work' and the 'ease of viewing animals'.

PPM Group 1

This list was further reduced through discussion to three as required by the PPM design. The three agreed criteria were:

UF 'More endangered', 'least popular' [currently] and '[ease of] viewing'.
PPM Group 1

Group 2 Criteria

Group 2 identified the following points as their primary criteria for prioritising particular parts of the zoo for enhancement: 'How much information is already available in the area', 'opportunity to see behind the scenes' and 'interactivity'. These criteria also reveal some of the fundamental ways in which participants thought existing educational or engagement provision could be enhanced. These points are explained during one of the plenary sessions within the PPM, as can be seen in the following extended extract.

- Mod Moving on to Group Two. 'How much information is already available in the area', so this was the criteria that the idea that some parts of the zoo seem to have a lot less information available now. So that would be one criterion for prioritizing them. Do you want to add anything on that?
- M2 For example, if you compare the Kirindy Forest area which was done quite recently, there's a lot more information there. And in the cloud forest zone or with the reptiles which there's less information, so there's less to look at there [currently].
- Mod Thanks, then 'opportunity to see behind the scenes'?
- F2 Well, when we went to the Reptile House, I think everyone found it really interesting going behind the scenes, seeing what's happening, seeing everything that goes on that the public don't get to see normally. So, just an opportunity to see, not necessarily actually go into the behind-the-scenes area, but just to go up to see what's going on.
- Mod Thank you. And then 'interactivity' was your third one, does anybody want to explain what's meant by that?
- F2 More talks by the keepers. So you're not just reading the information. You're actually being told by them. Maybe more frequently throughout the day [as well]. It seems like you can only feed the animals maybe once a day, but if people get the chance to see that more, then they'd be more interested in coming.
- M1 It also ties in with what [the other group] said about 'ease of viewing animals'. That's part of the whole kind of interactive experience with the animals in there.
- M2 And if I got to go up and have an opportunity to get closer and all the little kids- some of the adults are quite excited by it too. The little kids were like, 'oh yes, excellent', and they wanted to hear more and more about it because they had this opportunity to get closer.
- M1 The key thing is [...] basically making it a more interactive experience, so that the person comes out hears from someone that has that passion [about conservation] and also has a more interactive experience.

- F2 And [we talked about] how easily you could make the change for not all that much money and get a big impact.

PPM Group 2

Group 3 Criteria

Group 3 selected three criteria during their focus group discussion, which they brought to the plenary session: ‘expressing conservation messages’, ‘involving people’ and ‘return on investment’.

- Mod So for group three we’ve got ‘expressing conservation messages’ [as one criterion]. Can you explain that?

- F1 I think it’s which [zones in the wildlife park] can easily express a conservation message that people can get involved with and take action on. And a side angle to that is particularly [the zone’s relevance to] Durrell’s mission and areas of work, so islands and other areas experiencing conservation problems.

- Mod [...] Okay, and then ‘involving people’?

- F1 [...] It’s which [zone in the wildlife park] has the most potential for getting people to connect with the animals, perhaps – and this has just come to mind – but the actual country and habitat and people there. That’s where visibility comes in and getting [visiting publics] involved [in supporting pro-conservation] action. [...]

- Mod So you want to involve people as much as possible, as much as feasible?

- F1 As feasible, yes. [...]

- Mod Thanks very much. And then the third is ‘return on investment’.

- F1 And that’s basically [...] getting the most bang for your buck, so where can we put the money and perhaps where it’s got the most feasibility for change, where has got the least amount of things now. [...] So, how much is already available and how easily could that be changed for not all that much money and get the big impact?

Ultimately three criteria were agreed across the entire PPM, to be used as the basis for judging the different zones in the wildlife park and selecting one to focus on for the ‘Demonstration Project’.

- Mod So just to summarise, number one is ‘opportunity for improvement’ in terms of what’s currently there, how visited these animals currently are, [etc.]; number two is [potential for] ‘interactivity between humans and animals’ and number three is [potential for] ‘expressing conservation messages’, particularly around the most endangered animals, under the most threat.

Plenary Session

The reasoning behind all of the criteria discussed above is explored thematically in greater depth as this report continues. We first turn to the idea of ‘naturalness’, which participants raised as an important issue although it was not included in the final list of criteria.

Enhancing the ‘Naturalness’ of Enclosures

One factor identified as particularly important was the ‘naturalness’ of the enclosures. In particular, enclosures that were identified as ‘unnatural’ or ‘sterile’ were viewed as a priority for enhancement. Making enclosures more naturalistic was emphasised as a key priority, as can be seen in the extract below.

F1 But more like their own habitat, I think that was when we were talking about the actual environment within the compound or area.

F2 How to phrase it?

M2 More natural habitat for the animal.

PPM Group 1

It is noteworthy that participants identified the degree to which an enclosure mirrors its animal inhabitants’ natural habitat as an important factor in this discussion of zoo *education*. This suggests, the ‘naturalness’ of an enclosure is perceived as supporting the zoo’s educational provision.

F3 I wonder if it should be as the animals would find it in their own, where they live. Where they come from.

F2 Habitat should be as it would be naturally and natural.

F1 Well that is what they actually do try to do, isn’t it? In most of the areas, they do try to make it that way.

F2 Well I did find the reptile place rather sterile, as opposed to the outdoor spaces.

F1 But you couldn’t have those reptiles trotting about all over the place. So it appears the least natural, is what you’re saying?

F2 Yes.

M2 But you’ve got to tie that up with the fact that there is visibility, that we can see them. Because if you can’t see them in their natural habitat you need to see them there because that’s the purpose of the zoo.

F2 Oh yes, I agree with you. But I just found it rather sterile and a bit stark.

PPM Group 1

Thus, naturalistic enclosure design was advocated by participants as important within the context of zoo education, as well as for avoiding the appearance of the wildlife park as ‘sterile’ or ‘stark’ due to for example concrete enclosures.

Telling the Clearest Story: Focus on the Most Endangered Species in Zoo

Participants suggested that there should be priority on zones with animals that are “more endangered and [with a higher] level of threat” (F6, PPM Group 1). This would enable zoo educators to tell the clearest and starkest story about the conservation problems that are affecting wildlife worldwide. This criterion was summarised during a plenary PPM discussion with an emphasis on Durrell Wildlife Park’s Andean bears.

- F3 That was like the big bears, they’re really in danger of being extinct. And we felt that that was really really important that they were going to never be there again, like the Dodo which is what started it all.

PPM Group 1

In emphasising this criterion, participants were expressing their commitment to prioritising the communication of pro-conservation messages. Indeed, they wanted to highlighting major threats to wildlife such as “the [human] over-population, the hunting, the deforestation, the lessened natural habitat” (F6, PPM Group 1) for other zoo visitors.

- F2 I think it would be good to choose the zone which has the best potential for looking at the worst impacts to wildlife. The over-population, the hunting, the deforestation, the lessened natural habitat.
- F3 I think deforestation is probably one of the biggest threats to the animals, reptiles. Like, the forests are going in, which one was it? Mauritius was it? Where the habitats are being highly deforested.
- F2 And that’s the whole point to all that’s happening.
- F3 And what is there now, I mean we didn’t see pictures [in the current Reptile and Amphibian House signage] of what was there, what they have now. I think [the local human population] have fields of crops for themselves to eat now but what about the animals that are left?

PPM Group 1

Participants thought it was important for the wildlife park to make it clear to visitors how endangered certain species are within their collections.

- F2 It is an idea to have signs [that make clear how endangered particular animal species are]. Like, what was that one in Mauritius that was endangered?
- Mod The gecko, the lizard.
- F2 And the big bear. Now if you could put ‘this is an extremely endangered species’ and the bear, ‘there is only so many left’. I mean the polar bear stands a good chance of going very soon, doesn’t it? If people had something to grasp like that they were really perhaps the last 50 pairs on the planet and then they would get that idea that that beautiful creature is no longer going to be there. Or that ugly little thing that probably gives off something very important for our own lives – it would hit them. I think, I

don't know whether that's a criteria or not. I don't think there is enough signage personally.

PPM Group 1

Thus, participants advocated both more information about how endangered certain species are, but also that this information be communicated in a clear and perhaps dramatic manner (e.g. 'there are only 50 breeding pairs of this animal left on the planet') in order to have an impact on visitors' perceptions.

Telling the Best Story: Focusing on the Zoo's Conservation Work

One idea that emerged in discussion was that the zoo should focus its conservation education on the zones and animals that allowed discussion of the zoo's parent organisation Durrell Wildlife Conservation Trust's conservation activities.

- M3 I think the point is, which area are we going to decide on and why? That's the point, and I think what that does is there are techniques for doing it. Probably we need to revisit first principles. What is Durrell about? Which of those areas would be the easiest, in one sense, to be able to convert into supporting Durrell's message? And I think that you want one that tells that story.

PPM Group 3

This issue of trying to 'tell the story' of how conservation works through the example of Durrell Wildlife Conservation Trust came up in each of the focus groups. One point was whether particular animal species lent themselves best to telling the story of Durrell's conservation work.

- F1 You can look at what species. Personally, [...] I'd be interested in which one of the species can best convey an important conservation message that people can get involved in.
- M1 That's a criterion then that should be noted, 'which species can best express or be used to express [conservation] aims', absolutely. I completely agree and that's a criterion.

PPM Group 3

Another issue that was raised was whether particular zones within the zoo connected well with telling a clear story about conservation problems and how Durrell is involved in addressing them.

- F3 I wonder if it is worth looking at which zone best illustrates [...] the Conservation Trust's work.
- F1 Which area most illustrates the Trust's work?
- F2 Except, of course in a way, it doesn't matter if it doesn't illustrate the work so well because the aim is to develop the zone, do you know what I mean? If it doesn't ... how it exists at the moment is not-
- F3 But educationally if you look at the things that you want to put across information about conservation work.

- F1 The Trust's educational work, educational ideas?
- F3 It's 'work'. Not just educational work, but the [conservation] work they're doing in the field.

PPM Group 1

As can be seen in the extracts above, participants agreed that the education and engagement provided by the wildlife park should provide a window into how wildlife conservation problems can be addressed, using Durrell's conservation projects as examples.

Keeping the Zoo Experience Fresh and New for Repeat Visitors

To encourage local visitors to return again and again to the zoo, there needs to be a continuing sense of novelty to the visiting experience.

- F1 But, I think people want it to be bigger. As in the whole [Jersey] community, they want it to be bigger, because once they go see it- round and round, like loads of times- *they might want to see something new.*

PPM Group 2 (Emphasis added)

Of course, the animals themselves offer an inherent sense of novelty and unpredictability, particularly if they are engaged in a range of enrichment activities⁴. However, zoo education and engagement activities can support this goal as well by providing new information and activities in a lively and engaging way, so that a repeat visitor will find new things to do when they come back to the zoo for a second or third time.

General Directions for Developing Zoo-based Engagement

An important ambition of PPM participants was for enhanced zoo-based public engagement to successfully draw in new visitors to the wildlife park in order to expand the reach of Durrell's wildlife conservation message.

- M2 But we're talking about another issue now from what we were talking about, one of education. But it seems to me that if you've got the people here coming into the zoo and buying a ticket you're halfway there. They're interested. What about the vast majority outside those who come to zoos? How can we influence those? Because those are the important ones.
- M3 Influence them to do what?
- F2 To come.
- M2 Influence them to be interested in what we're talking about it.
- M1 And to come to the zoo.

⁴ Indeed, there is reason to hypothesise that increased enrichment, if done with visitors in mind as well, could enhance both animals' and visitors' experience.

- M2 Interested enough to be concerned. You've got a captive audience and you've got a willing audience in the zoo, they're halfway there. Isn't it more important about the ones who aren't-?
- F2 Yes, so are you trying to say that we need to get those ones into the zoo?
- M2 No, I think you need to get those ones interested in what we're talking about, in biodiversity, unless we're only confining biodiversity for the interests of the zoo. But I think that's narrowing it down a bit, isn't it?
- F2 Well, our current aim is to redesign an area in the zoo. I know what you mean.
- M4 So which area gives you the scope then to do the most-
- F2 We would use that area to bring people in who wouldn't have come before.
- PPM Group 3

Thus, the EU Zoos Demonstration Project was viewed as an important opportunity for the zoo to draw in currently unreached members of the local community.

Guidance and Interpretation

Participants highlighted the importance of general guidance and suggestions from the zoo, as well as the need for much greater levels of educational interpretation throughout the zoo to enhance the engagement value of zoo visits.

- F3 So I've got that down: a map with more direction rather than just a general map so you're not going backwards and forwards and missing things. And signposts.
- F2 And different enclosures.
- F1 When you get in the place and you see all these reptiles in front of you, it would be nice to know what they are.
- F2 But this is just general, this is just the whole zoo. As a whole. As you come through the gate what you think is okay and what you think would be more helpful.
- PPM Group 1

In general, participants highlighted the need for much greater guidance as they made their way around the site. One part of addressing this need for greater educational interventions from the zoo was to ensure maximum uptake of the existing provision of zoo engagement activities through clear notifications:

- F1 I think one of the things that's really good is the programme to keepers talks.
- F2 Keepers talks – really good.
- F1 Saying the timing of where it's going to be.

F2 Yes.

F3 Oh we had that when we came in the summer, but I found I couldn't get my timing right to be in one place and then leave there in time for the next one. Did you find that as well?

PPM Group 1

Beyond Signs. In terms of educational messaging, participants pointed to the insufficiency of relying solely upon signs, as many zoos do.

M2 You definitely need a more diverse education experience.

Mod Not just signs?

M2 You can't just use signs, because not everyone learns or takes information in from signs, and they haven't got the time and they've got kids and stuff.

F2 People are different as well.

PPM Group 2

There was dissatisfaction with the historical museum-like approach of using small signs with very basic descriptions in small print as the educational provision for the zoo.

Mod So, in terms of the, kind of, the way that the information is currently presented around the wildlife park, what do you think of that?

M2 It's little signs and everything, it's horrible. Like, I agree with what you were saying earlier, just having big signs with just buzzwords on, like Madagascar.

F2 Yes, like just one key following different choices, like a certain percent of...like a fact like that, that something that's going to stick in your mind, not just like reams of small print, writing about...although, you know, if you actually take the time to read it, it is interesting, but especially younger kids, who are going to be more influenced by the stuff going on, they're not going to stop and want to read it.

F1 You know where you drive in, yes? Those banners are there with the words on, there's no point in reading them, because you're just going to drive straight through, so no point in them.

M2 I like the fact they've used the quotes from Madagascar in the exhibit.

M3 Yes.

PPM Group 2

Small sized print on signs was identified as problematic, even when the content was viewed as useful.

- M1 The signs are a bit small. I like the fact that they've actually put endangered and critically endangered for the species, and they're showing the, kind of, gradient as well, but I think it needs to be a hell of a lot bigger.
- M2 But, it's probably, because obviously if you're going to have a big sign with just a few things on, there's a lot of information that you're not going to get on there, and like you're saying, it is quite interesting if you do take the time, so I wouldn't say, get rid of them completely. They can still say, but just have, sort of, the most important facts.
- F2 Yes.
- F1 Not as much reading.

PPM Group 2

Indeed, there was a consensus in Group 2 that signage should deliver core messages in fewer words. However, the fact that some participants indicated that they would be interested in some of the further detail suggests that zoos should consider ways in which different levels of educational messaging could be delivered to different audiences.

One point for development of the signage was to enhance their visual appeal.

- M3 You can still have signs as well.
- M2 Not everyone is going to learn through reading signs.
- M4 Not everyone takes the time to have a little read.
- F2 I think people notice visual things more, so if you change it like that, people are going to be drawn to come in, and then you can tell them the information with the keepers, so changing the outside is quite vital, to get them into the information.

PPM Group 2

While participants had reservations about the older, more text-heavy signs in the zoo, they did not reject the idea of having signs altogether. In addition to changing the content and visual appeal of the signage, participants also identified a need for consistent branding and style on signs across the zoo.

- F2 In the Reptile and Amphibian House, you can't go and stick big signs on the grass, because that doesn't work, so if you leave the little signs on, because it's not doing any harm, just leaving them on and then put bigger stuff, somewhere else?
- M2 It needs to be a more common format, I think, because the ones at the Reptile and Amphibian House, they're just like these green and blue signs, and there's no logo or common, and I thought, where your eyes, when you walk in, there's actually an old Jersey Wildlife Conservation Trust logo, that stuff must be ten years old. So, you need to have a common theme for

all that. They've tried to do it, and they redid the signs a few years ago, but it needs to be done.

PPM Group 2

Consistent style employed in all zoo signage has the benefit of helping to reinforce messages delivered across the zoo as well as the coherence of educational messaging. It also avoids the distraction of inconsistent elements.

Guided Tours. In particular, participants identified a guided tour from a knowledgeable and personable member of zoo education staff as an ideal form of educational interventions, which would enhance zoo visits substantially.

F3 I wonder if, I mean we've benefited from Jamie as we've gone around, he's been absolutely invaluable. The information that he provided would be great to have-

F1 So a guide do you think?

F3 Well they do have guides, they do have guides.

F1 Or some kind of, could there be, could you have headphones?

F2 That's a very good idea.

F3 Yes.

F1 Then you have your own personal little mp3 player kind of thing.

F2 I know they have that at different places.

F1 Yes they do have that.

F2 In different languages.

F1 Because it wouldn't tie up the [Durrell staff] or make sure [visitors] get there at 12 o'clock.

F3 It's a big expense.

F1 Well it is, yes but then you could charge.

F2 You could actually hire them out [to visitors].

F3 That's a very good idea.

F1 They do that at Disney, don't they?

F2 Once you have got it all sussed out, that saves paying guides.

F3 Expensive initial outlay but then-

- F2 But then the guides are available.
- F1 We found that when we were in Disney. The thing was we were with my husband's family who are Italian and don't speak English, couldn't get an Italian, so that was the difficulty. But I am sure here you can always have French and Spanish.
- F2 Because then you're directed to things that somebody who has a passion for it or an ability in this area, is actually saying this is a good thing or this is a good place to visit and this is what we are trying to do in this enclosure.
- F1 You can press a button on the one's that I've seen for whichever area you're in. Or you could pause.
- F2 We are talking about an electronic guide.
- Mod An interactive guide?
- M2 Gadgets.

PPM Group 1

It was emphasised that a guided tour through the zoo would be most effective if delivered by enthusiastic zoo staff, for example, early career animal keepers.

- F1 Something to do while they're walking around, or something to...
- M2 I know they do do guided tours, but I don't know how often they are or who does them? The impression I get is a lot of retired people, no offence, but I think people might prefer it if younger people would, more diverse people were involved.
- F2 Younger keepers as well.
- Mod That moves straight onto the next-
- M2 It's nice having the retired generation do it, but I think...if you know someone a bit younger.

PPM Group 2

This approach of using animal keepers to deliver guided tours would helpfully draw upon existing expertise within the zoo. However, additional training in presentation skills would be needed to ensure the quality of such guided tours.

Audio Guides. Audio guides were identified as one means for providing enhanced educational content for the zoo without the costly need for staff time devoted to the task. The idea was also suggested that audio guide headsets could also be used to add a sound dimension to visitors' experience.

- F2 I was thinking about this more Karindi, but it might work for the reptiles, a headset experience, having a headset on at some point, and that could transport you to the rain forest.
- M1 That's quite an expense though to provide those.
- M2 You mean sound?
- M3 It would be marvellous for people.
- F2 Because you can then be looking at the animal and you can be being told about it.

PPM Group 3

As can be seen in the extract above, audio guides were also seen as valuable because they could deliver relevant information while someone was standing in front of particular animals. Thus, a tailored form of educational provision would be possible without relying upon visitors reading signs.

However, participants in Group 2 identified some limitations around the social implication of using audio guides.

- Mod What about audio guides?
- M2 [Audio guide's would be] good.
- F2 It's a bit unsociable, isn't it?

PPM Group 2

In addition to concern about audio guides being 'unsociable', and therefore having negative implications for the inherently social experience of zoo visiting, there was some scepticism about how popular the guides would be.

- M3 I suppose most people who come here would be out for a day out with the family. Are they really going to want audio guides?
- M2 Some people, I have seen it at other zoos and people literally just walk around with earphones, yes.
- F2 It tells you stuff?
- M2 Yes, it's another option. [...]
- M3 I'm not sure that there would be loads of people who will take it up though.
- F3 Maybe if they're just going on their own, because quite a lot of people come in with kids and they're not going to want to walk around with earphones on.

M2 You never know, some parents might want to.

PPM Group 2

Thus the challenge identified by participants was how audio guides could deliver information without undermining the social aspect of zoo visits. This challenge may be surmountable, but the question of how widespread the desire to use audio guides within the zoo would be remains unanswered at present. How to deliver such a system most effectively and with what capabilities also remains a key issue for any future development of audio guides for the Durrell site.

Using Handouts. Flagging up that a handout or sign offers 'Further Information' for example could allow visitors who would prefer a more minimalist educational provision to opt out of this detail, while those curious for further detail would be able to access it. Indeed, informational handouts that visitors can take away with them offer a simple means of allowing visitors to self-select which information they would like in greater detail, as well as stretching the timeframe of the educational provision beyond the visit itself.

M3 One thing that I should mention is that I think with the whole information thing, the buzz word is information, but have little posts around the zoo, situated in main spots, like the café, and just near the gorillas and stuff like that, of little handouts that you can keep for yourself, full of information if you want to know about more in depth.

PPM Group 2

Indeed, the need for means of delivering information at different levels of specificity and through more portable media was a key focus in PPM Group 2.

F2 Different types of information, like watered down for the children and then more in depth, yes, different levels of it.

Mod Animal facts?

M2 Yes, they've got a bit like that at Kirindy Forest I think.

F2 So, you don't feel pressured that there's everything to read and stuff.

M2 It's a fine line between having enough information to educate and having too much information that people switch off.

One way of 'chunking up' the educational provision delivered by the zoo that was discussed was the use of informational handouts so that visitors could take information away and digest it later, rather than having to take in all the information immediately.

M3 That's the reason, because if they can take that around with them, then they're probably going to read them when they get home and since they do have little handouts situated in the little bits, but they're to keep up the zoo, so you have a quick glance at it, but you don't take it in properly.

M2 Especially if you've got kids as well, you're not going to stay and read something if you've got kids.

- F1 Maybe you should get a little children's book for the kids, so they can read it.

PPM Group 2

Thus, having additional information available for delivery through alternative methods of educational provision was advocated by participants.

The identification of a specific suggested route through the zoo was one suggestion.

- Mod Do you have things for the children that, when they come in, say a workbook and then when they get around it keeps them focussed?

- F2 That's good for adults too, like *a trail*. This is *a possible route* you might want to go that way.

- F1 So that's going back to the headphones.

- F3 Yes, because they do that in the Andean Bears thing. The sign asks 'how many birds can you see?' I saw a little sign that said there were eight of them.

- F1 Those are individual things, but if they got it for the whole thing. Then they know, let's go there because we might be able to look under the leaves to see if you can see that kind of thing, which is good. And the little tunnel.

PPM Group 1 (Emphasis added)

As can be seen in the discussion above, participants were satisfied that alternative means of delivering enhanced guidance for their visits could be developed. But it is most noteworthy that a significant expansion of zoo guidance and interpretation was identified as a crucial point for further development.

Engaging the Senses

In order to maximise the accessibility and impact of zoo enclosures, participants indicated that full use of visual as well as other senses should be ensured through the enclosure design. This enhancement of the zoo visiting experience was perceived to be an important part of engaging the visiting public with conservation. Of course, the first and most basic aspect of the zoo experience is viewing the animals, which requires animals to be visible and there to be a lack of obstructions to seeing them.

When asked to summarise key priorities, visual 'accessibility' was highlighted by participants in Group 1:

- M1 Accessibility.

- Mod With that do you mean ease of getting to the enclosure or do you mean ease of viewing, seeing the animals?

- M1 I meant seeing the animals.

F2 So viewing.

PPM Group 1

In the PPM plenary discussion, Group 1 summarised this criterion as 'ease of viewing'. One of the group members explained this criterion on the basis that seeing the animals is fundamental to developing appreciation for them and learning about them.

F2 Well, if you can't see the animal you're not going to be very interested in them are you? And that's what we felt was important.

PPM Group 1

Participants identified the need for transparent glass within the Reptile and Amphibian House glass enclosures as part of this fundamental requirement for visibility or 'visual accessibility'.

F4 I think there should be accessibility, shouldn't there, so that you've got a really good- Like the Reptile and Amphibian House, for instance, you look at it and in a lot of them you just get a reflection of yourself. You can't actually see into the enclosures.

F1 Mind you reptiles do tend to pick up the colours of where they are, so that you don't see them, because that is the whole idea, not to see them.

F4 But if you're seeing yourself reflected in the glass then you can't even...

F1 Point taken. Maybe you should have a special type of glass that doesn't reflect.

PPM Group 1

Indeed, as can be seen in the following extract, visibility was repeatedly highlighted as a key concern for visitors.

M1 I think the [animals that] would be most interesting to all of the people are those they can see most. Most of them are invisible.

F2 So that was the area most interesting?

F1 Yes. And accessibility.

M2 Well if you call it accessibility, yes I agree with that. But nothing do with whether there is any steps or anything like that, it's just whether... yes I think the ones there, they would be able to see more clearly.

Mod So just for the sake of other people understanding as well, what you are talking about [M2] is about the viewing, the viewability, the ease of seeing the animals, is that right?

M2 Yes it is really. [...]

- F3 Well if you can't get to it you can't view it can you? [...]
- F1 Ease of viewing animals – [M2]? [writes on flipchart]
- M2 Yes, the creatures, seeing them where they are.
- F4 Yes.

PPM Group 1

Participants' discussion of the importance of visibility displayed some interesting nuances in their understanding of the zoo's position and needs. However, it was suggested that the zoo needs to be clearer about the reasons why visibility is not possible in certain cases. Essentially, this could be viewed as a call for greater transparency in terms of the zoo's decision-making and, crucially, clearer communication with visitors.

- F1 If you are going to say let's look at these animals for whatever reason. It's nice to see them, having said that in one of the cages I saw a sheet saying sorry if you can't see these animals but then a bit like you said, they're busy working outside, maybe go outside and see them. So part of the visibility it to educating as to the need to see. You don't always- there'll be pictures and at some stage you will see the animal. You may not see it within the cage or behind the glass until you get outside, do you understand what I mean? I am not saying to try and make it difficult.
- F2 You want notices then, don't you?
- F1 So it is educating people to actually cope. Well the reason we may not see this animal is not because the Durrell Conservation Trust doesn't want us to see them, and understanding that their natural habitat is actually a place that is difficult for us to see.
- F3 Maybe that's a good reason to have that as a criteria because when we go onto the next step where we are working out what we can do about that then that is an important thing, isn't it? If you have that as one of your criteria then all that you are saying will follow it, then we can work out, discussing how we are going to do it. So it is an important thing to be told why you can't see the animals at this particular stage.
- F1 Yes, if you can't see them you would like to know why.

PPM Group 1

In addition to the issue of engaging the visual sense through the animal enclosures, there was also a need to ensure that informational signage provided around the zoo was visually arresting.

- Mod [M3], what do you think of the way the information is presented?
- M3 Yes, it's just got to be more the sign and things and being parts [unclear].
- Mod So, less detail?

F1 Brighter.

M3 Like the detail there, but just adding bigger things.

F1 Brighter colours.

PPM Group 2

In terms of the content of the signs, participants pointed to the importance of relating the scientific content or conservation message of a sign to visitors' lives.

M3 They need to relate it more to our lives as well. I know some people do, are concerned about stuff, but other people is, what's it to me? It's a million miles away on some island somewhere. You've got to relate back to their everyday lives at the same time, so maybe change the direction that some information is, and perhaps put even more detailed information in leaflets and stuff.

PPM Group 2

It was seen as important to avoid the use of abstract messaging that assumed that visitors already understand the issues. Instead, zoo education should reveal the ties that bind the world's wildlife to the daily lives of European publics.

Volunteers and Zoo-based Public Engagement

Participants could see the staffing implications of providing more guided tours and greater interactions. In the following extract, one participant indicated that she did not think the normal complement of zoo staff would have the capacity to also provide guided tours:

F2 They haven't got time, I don't think, with looking after all those animals, it would have to be volunteers, that would. It couldn't be people who work here.

PPM Group 1

As can be seen in the extract above, in order to address this logistical challenge, they suggested that volunteers could be recruited for public engagement activities at the zoo.

M2 We said outside, a group of volunteers because sometimes that staff might not have enough time to do that, so if you trained up a group of volunteers that are actually specifically there, like in airports, you get the people who help with customs, with their massive T-shirts that say, ask me questions about what you're allowed and what you're not, and they're there to help. Same kind of thing. [...]

M1 At the museum, a load of my friends volunteered there, got trained to do inverts and that just sat in the invertebrate house all day, chatting to people.

F3 A lot of people want work experience and stuff.

F1 They can't get it, because- [...]

M3 Just a case of getting more volunteers.

PPM Group 2

In order to help them refine their suggestion of using volunteers, the Group 2 focus group moderator asked for more details about the level of training required and the responsibilities participants saw volunteers fulfilling.

M2 Instead of the keeper talks, instead of it anchoring it to this actual place, maybe you could get events going on at the centres or in primary schools, secondary schools.

F1 Yes, get people to go and talk at primary schools, that gets going.

M2 I think they try and do that, but again, they've just pulled the funding. [...] It's the right way to go, though. [...]

M2 You would have specific volunteers throughout the day, it doesn't even have to be the whole day, just one person in the morning and one in the afternoon.

F2 At peak times or something.

M2 Or, even just during holidays, like during half term.

Mod What would you have them do specifically?

M2 I'd basically have them walking around the Reptile and Amphibian House, just basically smiling and saying hello and basically being as open as possible, so people can actually come up to them and ask questions and stuff.

F3 Yes, and if they had t-shirts to say, 'ask me questions, I'm here to help', so that people know that's what they're there for.

PPM Group 2

This role for volunteers was seen as a way of enhancing visitors' experience without unduly taxing the time of keepers and curators, who would be busy tending to the animals.

Multi-Sensory Engagement Experience

Beyond this basic requirement of visibility, participants also identified the importance of zoo educators engaging other senses, such as hearing. In essence, participants were advocating an 'all embracing' multi-sensory immersive experience for enclosures and the buildings or spaces surrounding them.

F2 It needs to be friendly. It needs to be a welcoming place. I don't quite know what they mean by that but, for instance, [my husband] is partially sighted and he can't see so perhaps there needs to be something outstanding, that he would be able to relate to as he goes in, but that is just a personal thing,

I know. But it needs to be all embracing as far as welcoming into the place, to make you think, oh, this is good!

F1 Well, like the noises in the Kirindy Forest [enclosure] and the sounds of birds in [the] Jewels of the Forest [enclosure]?

F3 Yes that was good.

PPM Group 1

Interactivity

As soon as the Reptile and Amphibian House was selected as the zone to be developed for the present project, 'interactivity' emerged as a central focus across groups. Indeed, Group 1 saw unique opportunities for 'interactivity' in the Reptile and Amphibian House.

F2 I feel that people, I also feel that there is so much there in the Reptile and Amphibian House. Like children being able to hold them. Young people being able to stroke them or maybe when it's feeding time, if they are under supervision, they could actually help with the food. If they were under supervision.

F1 So you want more interacting in all areas?

PPM Group 1

It became clear as groups discussed the idea of interactivity that what they meant by this was the opportunity to 'get up close to the animals' and ideally to be able to touch them.

F3 The thing is, it's difficult to interact with a bear or-

F2 You can't.

F3 You can't, no. And all you can do is really look at them, and so it's not going to do an awful lot.

F2 No.

F3 Whereas with reptiles you can get up close. I'm not that keen on reptiles, but-

F1 You can stroke them.

F2 Yes.

F3 And I think with say children and young people, if they let them handle them it can make a big impact. I think [anonymised] when he was at primary school actually held a reptile or it might've been [anonymised] because he's more outgoing.

PPM Group 1

As can be seen in the extract above, on this criterion smaller animals such as reptiles were seen as having an advantage over the conventionally charismatic large mammals such as bears.

Interactivity and Communication Technology

One line of discussion related to interactivity was the need for visitors to be able to raise questions that could be answered by zoo staff. Given the practical limitations on the availability of full-time expert zoo staff during the day, communication technology was seen as a way to enable this form of interactivity between keepers and curators on the one hand and visiting publics on the other.

This discuss began with the idea that visitors would benefit from being able to receive 'feedback' from engaging in dialogue with zoo animal staff.

Mod And you wanted [...] feedback?

F2 Yes. [...]

M1 Opportunity to provide feedback.

M3 Yes, I did.

PPM Group 3

The discussion of how precisely this feedback system could be implemented centred on the potential of communication technologies.

F2 Perhaps people could write things and put them in a box or a video diary. You could have a little video diary; people get their ideas recorded. [...]

M1 What about a little computer screen where they can type in their email message, email the keeper right now.

F2 Yes.

M1 Get your email address, they could build up their electronic database and the keepers could come and get back to the person.

F2 The only reason for the video diary is we said the whole reading and writing thing. Talk is perhaps easier, you know. Or you can have various alternative ways of doing it.

M4 Yes, spread out over a week, so if there's something happening one day, talking to a keeper the next day. You've got-

DN Talking to keepers, shall I put that down?

As can be seen below, the discussion about have a 'feedback' mechanism for interacting with keepers to learn more about animals ended on the idea that this could be done through email:

M4 And also that's not too onerous a job [for the keepers], is it? I think that's a really good point about emailing people.

DN Because they know the animals better.

M4 Email your keeper.

PPM Group 3

As can be seen in the discussion above, participants were interested in having a mechanism for interaction (albeit mediated) between animal experts at Durrell Wildlife Park and visiting publics. This kind of interaction connects very well with past science engagement initiatives in the UK, which could be considered to inform the way in which such a 'feedback' mechanism could best be implemented by zoos. This may also be a domain in which a partnership with a local university's biology department could offer fruitful synergies for public engagement, with for example biology PhD students contributing to such engagement activities. Trainee keepers and education volunteers could also support this kind of public engagement activity. Moreover, links could be made between web-based public engagement activities and invitations to attend future events at Durrell and generally become more involved in Durrell's work.

Targeting Under-Used Parts of the Zoo with Under-Appreciated Animals

Participants indicated that the zoo had elements that were clearly old and would not be perceived as interesting by most visitors. These areas then comprise an important focus for new zoo engagement materials and activities to breathe new life into these tired parts of the zoo.

F1 [The Wildlife Park is] not very interesting.

Mod Not very interesting?

F1 If you've been there before. If you've been there for ages, it's just like, like if you live on the island and you go to it, like, every day, it kind of gets boring, because you see the same thing, and it's not really much to do, so-

M2 Think those in transition, like because obviously the site, some of it's quite aged, and some of it's quite new, so there's quite a lot of, the education stuff especially is quite diverse, and what, in different exhibits. For example, the Kirindy Forest is really good, because you know, it's brand new, and so is the meerkat enclosure, but older enclosures aren't so interactive with stuff, so it's quite mixed when you walk around.

F3 And, I think that makes people concentrate more on, like stuff like the Kirindy Forest that's new, they're going to go there, and watch more of that, than if it's just an old building.

M2 Yes, especially-

F3 There's quite a lot of stuff people aren't normally as interested to see.

PPM Group 2

Participants thought it important that currently under-utilized parts of the zoo be enhanced to ensure greater visitor involvement and enhance educational impact. In part, this aim might require increased directional signage and internal advertising of under-visited zones within the zoo, but this was also viewed as a problem that could be targeted for educational interventions designed to enhance appreciation for particular species.

- F1 Because we should be able to ensure that every part of the zoo is well understood, well visited. And if there is a part that the visitors just zoom past, then we should be doing something at that zone to enlighten people how important that particular zone is and whether it's reptiles or monkeys, I just think you should go for the zone which, at the moment, is being lost because people just go straight through it. I'd turn it into something that people actually wanted to go and watch. [...]
- F2 I think [F1]'s suggestion about the least popular one, was a very good suggestion.

PPM Group 1

As can be seen in the extract above, the discussion of under-utilized parts of the zoo turned to the issue of certain animal species being under-appreciated by visitors. It was suggested that these under-appreciated species should be a major focus for zoo educators in order to enhance interest in these animals and concern for their conservation.

- F2 That ties in with what was said about the less obviously liked things like the cockroaches. The pictures that they showed that the children had drawn who saw them show there's interest. Given there is some reservation about something that is less attractive, perhaps we should choose them to focus on. [...] They deserve a bit of focus regardless whether it's a pretty animal or an ugly insect. Well in this context especially with the issue of conservation.
- F4 And a lot of people are really quite frightened of reptiles and if they could see them and become acquainted with them, [...] just to show people that they're not going to hurt anybody, as long as they're not attacked [it might help].

PPM Group 1

As can be seen in the focus group extract above, this task of enhancing visitors' interest in currently under-appreciated animal species was most salient for species such as snakes and other reptiles that large segments of the visiting public may view with suspicion or fear upon arrival at the zoo. In such cases, the priority identified by participants was to assuage such fears and instead encourage positive attitudes towards these species along with an interest in their conservation. Essentially, the reasoning was that visitors must first be persuaded of the intrinsic value of an animal species before they could be persuaded of the importance of conserving that species. In the case of charismatic animals, this first level of persuasion may require very little, but for feared or uncharismatic species, it is up to zoo education to overcome these affective barriers to public engagement with wildlife conservation.

This line of argument about the need for zoo education to show visitors why the less charismatic species are interesting and worth learning about was also developed in Group 3:

- M2 So in choosing which one you're going to focus on, you're really eliminating some of [the species in the zoo] because they'll stand up by themselves, they just don't need extra help because they're so appealing in themselves.

- F1 But they do. Every animal needs it.
- M2 They don't actually need-
- M3 Well, I think the other ones-
- M2 It's the other ones that need the attention, surely.

PPM Group 3

Going Behind the Scenes to Enhance Educational Impact and Transparency

Participants identified educational value in learning about the 'behind the scenes' needs of the animals (e.g. the breeding of insects for the animals' consumption in the Reptile and Amphibian House).

- F2 Also too we didn't particularly see what they ate until we went to see where they were made. That was really interesting, the breeding of all the cockroaches and whatever. I found that fascinating.
- F3 I think more access, as well, to what goes on behind the scenes, if not the actual breeding, but just to see how the staff look after the animals. Because I had no idea what went on behind there.

PPM Group 1

Importantly, as can be seen in the extract above, this increased 'behind the scenes' access was thought to be most valuable when it was guided by zoo staff, who could provide context, explanations and answer questions.

Indeed, as was highlighted in the specific recommendations for developing the Reptile and Amphibian House-based education and engagement, participants valued the idea of being able to see 'behind the scenes' at Durrell. Part of this interest came from the direct connection between this backstage work and conservation breeding programmes focused on endangered species not normally visible to the public. However, this work was also seen as inherently interesting.

- F2 Perhaps some of the preparation areas could be, people could view from the outside. So they could get the opportunity to see the food that we did.
- F1 Through a window?

PPM Group 1

Ultimately, participants thought that providing this window onto the backstage work of the zoo was most valuable as a means of making the zoo and its efforts more transparent to visitors.

- F2 If it was just in a back room somewhere, so [visitors] could look through and see that's the food that they are preparing [for the animals]. And in other appropriate areas, it may be possible, from the outside, to let the public see in, so that they would be aware of the fact that you told us, that

in this building 50% is not visible to the public. The staff is busy [because of these duties] and the fact about the food that is given to the animals, like when we looked at the locusts and crickets. That way more members of the public can be informed about that and know that that's going on.

- F3 Also too I think another thing that's so important is to get over the expense of feeding all the animals. There were some beautiful tropical fruits in there and I noticed a lot of spinach going in. Is there any information currently about that? Are the public informed about it?
- F1 Well there is a big signpost outside saying an adult animal feeding for a day costs a certain amount and that sort of thing.
- F2 But maybe around the place, within any zone or area, just to make people aware of it.

PPM Group 1

This idea of keeping the visiting public informed and maintaining transparency about the zoo's work and expenses does not fit easily within a conventional education paradigm. However, from a public engagement perspective, conceptualising and treating visitors as contributing members in the pro-conservation mission of the wildlife park makes sense. This approach to visitors could frame them as citizens of the zoo, with the concomitant need for the zoo to be transparent in its actions.

Need for Active Guidance from Durrell Staff or Volunteers

Participants identified the importance of active engagement by Durrell staff or volunteers in order to enhance the visitor experience and educational impact.

- F1 And what about having interactive presentations? As you say, just like they do in museums, have something in there where you just chat to people.
- M3 They use those a lot in America, those volunteers, and they do it. They have lots of that, but they use the volunteers.

PPM Group 3

The value of such in person engagement opportunities was also identified with specific reference to children.

- F2 Children, I think, can lose interest. Although they're all 'oh, oh!' [excited], at first, but they can lose interest very quickly. But if there is somebody around who could perhaps latch onto a group of children- I mean, I presume that schools come here and have educational talks? But even if you had, I know in my own family, my sister-in-law comes with her two children quite frequently after school and I think if you had a group of children coming after school and there were people who would latch onto them and just explain a few things and then wander off to another group of children. Because there must be, in the school holidays, must be loads of kiddies out there.

PPM Group 1

This suggestion of ensuring that their education staff actively engaging young visitors connects to the broader theme in the PPM highlighting the need for more extensive and personal approaches to engaging visitors (i.e. beyond signs).

State of Mind: Being 'learning ready'

Clearly, factors such as fatigue could impact the ways in which visitors respond to any engagement activities put on by the wildlife park. The youngest participant in the PPM (age 7) identified a concern with the high level of walking required to go around the zoo.

- F1 Maybe we can have something to get the people around walking, maybe we can have, maybe, like...
- M2 Buggies?
- F1 Buggies or something.
- F3 I think it's quite an experience though, coming, like walking around the whole grounds and stuff.
- M2 Yes, it's much, yes...
- F1 Trying, kids get under, like, angry when they start walking. I know I used to do that when I was little. Angry.

PPM Group 2

Indeed, while some walking around is likely to support blood flow, generate positive energy and therefore contribute to learning, an excessive amount of walking could exhaust children in particular (given their shorter legs), limiting total visit time in the zoo and creating negative affect. Such negative reactions to excessive walking would negatively impact learning. Therefore, finding ways in which the zoo can limit visitor exhaustion is in the interest of conservation education, visitor satisfaction and other positive outcomes from zoo visits. Some options to address the problem of visitor exhaustion that could be considered include:

1. Introducing a train that goes around the park, for example, as Chester Zoo have done. The added benefit of this approach is that it offers an excellent opportunity to introduce educational content tailored to particular parts of the wildlife park.
2. Ensuring that seating is available for engagement activities such as keeper talks.
3. Guiding visitor flows through the park in such a way that they are likely to stop at the zoo's café mid-way through their visit, providing them an opportunity to rest and regain their energy before pressing on.
4. Re-structure guidance within the park so that visitors are advised which areas require the least walking to reach, thereby ensuring that long treks to the outer reaches of the wildlife park are only attempted if the visitors feel they will have the required energy. An interim solution in this vein would be to add walking time estimates to all signage, but particularly to signage that will be encountered at the beginning of the zoo visit.
5. To tackle this problem even more directly, visitor flows through the park could be managed so that the enclosures near the entrance (with limited walking required) are seen first.

If some kind of mini-transit was put in place in the zoo, this would offer an excellent location for educational provision, as was recognised by participants. In describing this, one participant drew upon the cultural resource of having seen the interpretation approach in the fictional Jurassic Park, featured in the 1990's film.

- F1 Those places where there's a little TV inside it, and there aren't really good, because people just walk past them.
- M2 Those interactive trucks, like in Jurassic Park where they go around.
- F1 Put a TV on them and just walk around with the advertising, that would be good, and then a mascot to go like this, on the back of the truck.

PPM Group 2

As can be seen from the results above, visitors clearly value the engagement and education functions of the zoo. They have high hopes that these functions can be enhanced to improve the visitor experience and pro-conservation outcomes for the benefit of wildlife.

Advertising and Income Generation

Group 2 in particular was very enthusiastic about the idea of Durrell buying advertising time to bring in new visitors to the zoo.

- F1 Maybe, you know those movie things, with the adverts, why don't we have one of them. In the movies, you have the adverts, you could get one of them.
- M3 Too expensive. It would cost a lot to put adverts out.

PPM Group 2

In order to fund these advertisements, the group saw no problem with developing explicit relationships with companies and allowing them to put their brands on enclosures within Durrell.

- M2 Why doesn't Durrell hire out advertising space on its website?
- F1 Yes, or in the zoo.
- M2 'Come to Durrell, go and see a Ferrari'.

PPM Group 2

At this point, the discussion shifted to a detailed consideration of corporate sponsorship as a means of funding additional education and engagement.

- M2 Or, like I said, in Chester, the Jaguar exhibit is sponsored by Jaguar, the car company. And they have a massive Jaguar sign in front of the enclosure.
- F1 Have we [Durrell Wildlife Conservation Trust] got a [corporate] sponsor?
- Mod There are a number of sponsors actually, yes.

- M2 And, they're basically-
- M3 Well, there are certain criteria sponsors have to buy sponsorships. Then obviously with sponsors as well, what was I going to say, you apply for specific projects- [...]. I think basically all charities basically apply for sponsors, just not competitive enough.
- F1 We still need sponsors for money [to enhance the wildlife park's educational provision]. [...]
- M2 But, you can't- basically, there's also a conflict of interest. You can't get money for one thing, and then money from another company to do the same thing, because then you're going against the other company.
- PPM Group 2

Finally, the youngest member of the focus group suggested holding some kind of sale to raise funds.

- F3 Can't you sell some stuff?
- M2 Like what?
- F3 I don't know.
- M3 Get a meerkat for the weekend [joking].
- F3 Maybe you could rent out a room?
- M2 They do that in the training centre. They do that now.

PPM Group 2

This discussion suggests that these participants see little problem with Durrell or indeed other zoos engaging in explicit commercial dealings in order to raise funds to serve their core conservation mission.

Discussion

This report identifies the perspectives of zoo visitors on the crucial question of how zoos can best engage publics with wildlife conservation. While some aspects of zoo-based public engagement are necessarily context specific, a number of key principles of visitor-centred zoo education have been identified in the Results section above.

Visitors' Integrative Vision of Zoo Education

Clearly, the expectations of the zoo amongst visitors were noticeably different from the self-perception of this and many other contemporary zoos on important points relating to the ways in which zoos approach public engagement. The discussion amongst participants focused very specifically on how best to deliver a message about wildlife conservation, and concomitant considerations about how visitors could best be prepared for such messages by improving the general visitor experience across the board. Particularly noteworthy is that participants did not draw a sharp distinction between the zoo's educational role and any of its

other functions, from serving good food at the café to ensuring that children do not become too tired on their feet from excessive walking. Instead, visitors viewed all aspects of the zoo visit as inextricably linked. For example, if a visitor has an unpleasant eating experience in the café, they will not be in a good state of mind for receiving an educational message.

In general, participants identified a wide range of creative developments that they felt could enhance the visiting experience. The young people focus group (Group 2) yielded a particular emphasis on making the provision of educational and pro-conservation content multi-sensorial and dynamic, with scope for visitors to interact with animals and knowledgeable zoo staff.

The aims set out for zoo education by participants were ambitious, signalling their optimism that zoo education done right can achieve important pro-conservation impacts for visitors at multiple levels. As can be seen in the extract below, zoo education was envisaged as having impacts on both the affective level of enhancing empathy for animals and the cognitive and intellectual levels of increasing conservation knowledge. These potential impacts were articulated by a participant in the members group, in the extract below.

F1 [...] Engaging our visitors in wildlife conservation is on several levels. As you say, there is the adjustment, getting them to have the empathy with the animals, the connectivity with the natural world, and then you've got fundraising which is where we're getting people to come back to the zoo as part of- and also membership. Then you've got educating about things, that they can do something about, so for instance an example that is always used is the palm oil and the orang-utans and how getting palm oil is basically destroying their habitat and so people can just buy alternative products. But I also have ideas as to whether you can use an exhibit to- we should actually bring in that biodiversity fragmentation map, explain it, and then say to people, well, this is an example of the same concept in your area.

PPM Group 3

Thus, as can be seen in the extract above a whole panoply of positive impacts were identified as achievable aims for zoo-based public engagement with wildlife conservation.

Calls for zoos to be transparent about their work both inside and outside the zoo were unexpected. This suggests that some of the developments within the mainstream of public engagement with science literature may be more applicable to the zoo context than one might expect. In particular, the present data suggests that there may be a need for 'see-through zoos', which are open with visitors and members about the ways in which their resources are used to address their core conservation missions.

The opportunity to touch and generally get closer to animals was highly valued by focus group participants.

Conclusion: Towards Visitor-Centred Public Engagement in Zoos and Aquaria

Zoo-based Public Engagement

Although there has been a range of visitor studies conducted in zoos and aquaria, this project represents the first ever example of 'upstream public engagement' in zoos, wherein the

results of a rigorous and systematic engagement exercise feeds directly into action in a way that fully empowers participants. There are clear patterns in visitors' priorities for zoo education and public engagement, which can be seen in the results explicated above. These results also help to explain some of the more negative findings within zoo visitor research, which indicate for example that visitors spend very little time reading current educational signage. This particular negative outcome for example could be attributed on the basis of the present research to the failings of existing methods of engaging publics with wildlife conservation, rather than to an inherent lack of interest in this topic. Such findings suggest that zoos should be optimistic about their potential impact as sites for public engagement with wildlife. At the same time, these results also point to a wide range of directions for future development to facilitate such impact.

The carefully designed approach to this public engagement activity resulted in positive experiences for participants, as well as clear and usable public input on zoo education, which will be fed directly into the forthcoming 'Demonstration Project' for the EU Zoos project. The core principle of this exercise in upstream public engagement was to be transparent in the decision-making process by being clear with participants about the scope of their input and how it will be taken forward. Moreover, as this lengthy report shows, participants' views have been recorded and fully analysed. Future development at Durrell Wildlife Park will be able to draw direct inspiration from these results to enhance the experience for the visiting public.

Participants in this unique public engagement project identified a number of directions for future development. In some cases, participants views support larger historical shifts in zoo design towards more naturalistic and immersive enclosures. One point worth noting here though is the value of having plants and other naturalistic features on the visitor side of enclosures. This could foster a greater sense of connectedness to the animal through the shared natural environment, which is a broader conservation idea that zoos would like to encourage (i.e. recognition of the interdependence of all life on Earth). In a similar vein, participants valued the provision of a multi-sensory experience (e.g. the sounds of rainforest animals playing and the smell of rainforest flowers). This was viewed as facilitating learning about the connection between animals living in captivity in the zoo and their wild counterparts' natural habitat. In order to further enhance and connect this kind of learning about animals and their habitats to specific pro-conservation ideas, it was suggested that the zoo's educational messaging should be organised around a central theme or a minimum around zone specific themes. Any information communicated through signs should be kept as short and focused as possible, with large vibrant images of animals or habitats accompanying it. Where it is desirable to provide visitors the opportunity to go deeper and learn more about a conservation topic, handouts can be provided, with additional potential for a 'drive to web' approach to delivering follow-up information.

Ultimately, participants saw great value in Durrell Wildlife Conservation Trust engaging visitors with wildlife conservation. They advocated stepping up and enhancing current practices across the zoo, but especial in the Reptile and Amphibian House, which was selected as the site for the EU Zoos Demonstration Project at Durrell. Participants sought from the wildlife park greater transparency about its many conservation activities and greater opportunities to becoming involved in promoting wildlife conservation both individually and collectively. As this public engagement event shows, involving publics can be very fruitful, but it requires institutions giving up a degree of control to allow for direct and meaningful involvement.

A key finding from this engagement event is that visitors consider the zoo in its entirety, rather than in the segmented functions that zoos frequently self-identify (viz. Conservation, Research, Entertainment and Education). One implication from this finding is that zoos should consider abandoning these longstanding distinctions in favour of the broader idea of 'public engagement' as an endeavour that cuts across these functions. Indeed, like other scientific institutions, zoos (and the science and conservation they practice) may benefit from a full commitment to the principle of public engagement, with upstream engagement activities shaping new developments across their portfolio of activities. The reasons for such a shift align well with the basis for the broader change in the sciences' approach to publics in Europe (see Jensen & Wagoner, 2010), which was reviewed at the outset of this report. The public engagement paradigm offers zoos the prospect of engaging ever more fully in the promotion of pro-conservation social change for the benefit of both wildlife and the development of a more sustainability society. This effort requires the commitment of not just the education staff at zoos, but the entire institution. In return for this broader commitment to their publics, zoos may gain greater visitor satisfaction, public interest and involvement and a much expanded role within the struggle for pro-conservation social change in the public sphere.

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Appendix 1 – Informed Consent Form

Public Participation Meeting - Participant Consent Form		
EU-Zoos-XXI Project (www.euzoos-xxi.org)		
<p>This project aims to inform the development of effective informational materials and activities for zoo visitors on topics related to wildlife conservation. In the process of seeking your input for this project, we will need to record your words and ideas as (which will be treated as 'data'), so that we can carefully consider what you have said and try to incorporate your ideas to the greatest extent feasible. As such, we request that you indicate your willingness to participate as follows:</p>		
I agree to take part in the project which will include giving my views on information provision at Durrell Wildlife Park and related topics and being recorded <input type="checkbox"/>		
I understand my personal details (e.g. phone number and address) will not be revealed to people outside the project without my explicit consent <input type="checkbox"/>		
I understand that my words may be quoted in publications, reports, web pages, and other outputs but my name will not be used without my explicit consent <input type="checkbox"/>		
I agree for the data I provided to be archived for future use if necessary <input type="checkbox"/>		
I understand that other researchers or educators will have access to the data only if they agree to preserve its confidentiality and follow the terms specified in this form <input type="checkbox"/>		
I understand that other researchers or educators may use my words in publications, reports, web pages, and other research outputs according to the terms specified in this form <input type="checkbox"/>		
I understand that, if this research is subject to a Freedom of Information request, then the data may have to be released to a third party in an anonymised form <input type="checkbox"/>		
I consent to being included in photographs or videos taken at the event, which may be used in publications, reports, web pages, and other outputs (Note: If you don't tick this box, we will ensure you don't appear in any photos or videos taken at the event) <input type="checkbox"/>		
I understand that I can withdraw my participation and leave this meeting at any time <input type="checkbox"/>		
<hr/>		
Name of Participant	Signature	Date
<hr/>		
Researcher / Educator	Signature	Date
<hr/>		
Contact details for further information: itc@durrell.org		
Jamie Copsey, Durrell Wildlife Conservation Trust		

Appendix 2 – Educational Opportunity Zones Informational Handout

Educational Opportunity Zones

There are four zones/enclosures within Durrell's Wildlife Park where we know that we could significantly improve the information and educational materials currently available. During the workshop on Saturday 23rd, you will be given more information on these areas and you will get the chance to visit them as a group. By the end of the workshop you will have had the chance to identify which zone you think is the priority one to have a make-over. We will then decide as a whole group which is the priority zone for new information, activities or materials and what form this should take. This proposal will be taken forward and turned into a reality during 2011, so you will get the chance to see your ideas put into practice! (Note: we are also interested in your feedback about the rest of the Wildlife Park experience and we will do our best to incorporate your ideas in future developments around the park as well).

To help you prepare for the workshop we have written a short summary to explain the location and current purpose of each of the five zones we have identified. We have also given you some brief information on the animals that live in these areas to help you build up a picture of what you think are some of the most important messages to be conveyed to visitors, such as yourself.



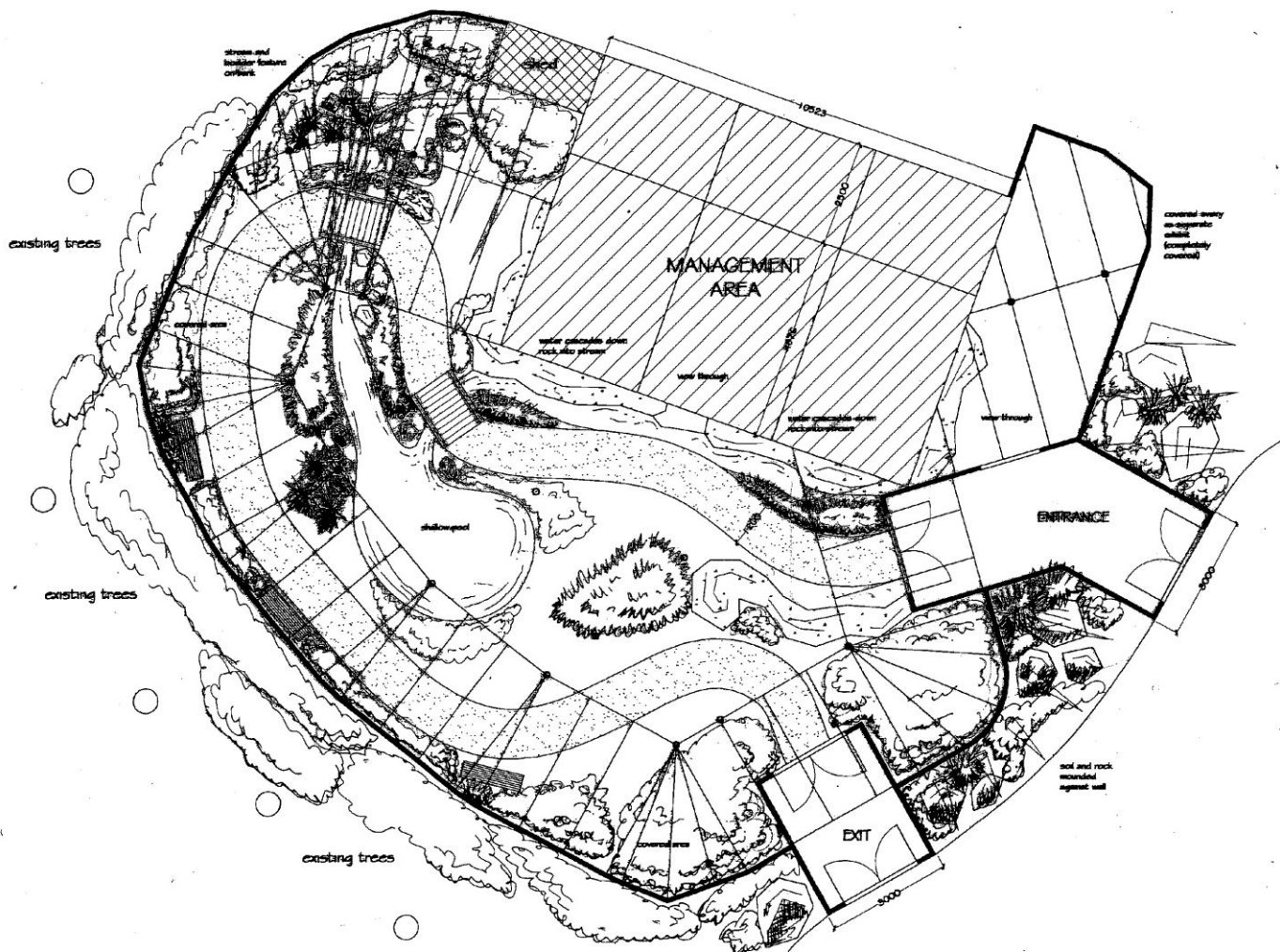
Zone 1: Jewels of the Forest

'Jewels of the Forest' is a walk-through aviary designed to give visitors a sense of what it might be like to walk in a tropical rainforest and glimpse some of the exotic birds which live there. There are 13 species of bird living in Jewels of the Forest, including the closest living relative of the dodo, the Nicobar pigeon. This large, iridescent-blue feathered bird lives only on the Nicobar islands, off the South East coast of India. It is believed that a distant relative of this bird once flew to the island of Mauritius where it grew in size in the absence of any natural predators. Eventually the bird lost its ability to fly, as it did not need to escape from any other animals. Finally the dodo evolved, a flightless, giant pigeon, marooned on the island of Mauritius in the middle of the Indian Ocean.

Currently the only interpretation in Jewels of the Forest is an identification card which tells you the names of each of the species of bird found within. There is both an entrance hallway and an exit room, both of which have large, blank walls and ample space for educational materials inside the enclosure as well. The message could be to tell about the wonder and uniqueness of birds (how they live their lives and where); or it could focus on particular species such as the Nicobar pigeon and talk about how bird species have changed into many different forms when isolated on islands. Or it could simply tell people where to find the birds when they go into the enclosure and how to enjoy the experience. Remember this enclosure is near the entrance to the wildlife park and so could present a perfect opportunity to introduce visitors to the park, Durrell's conservation work around the world.



Some of the birds you can see in the Jewels of the Forest

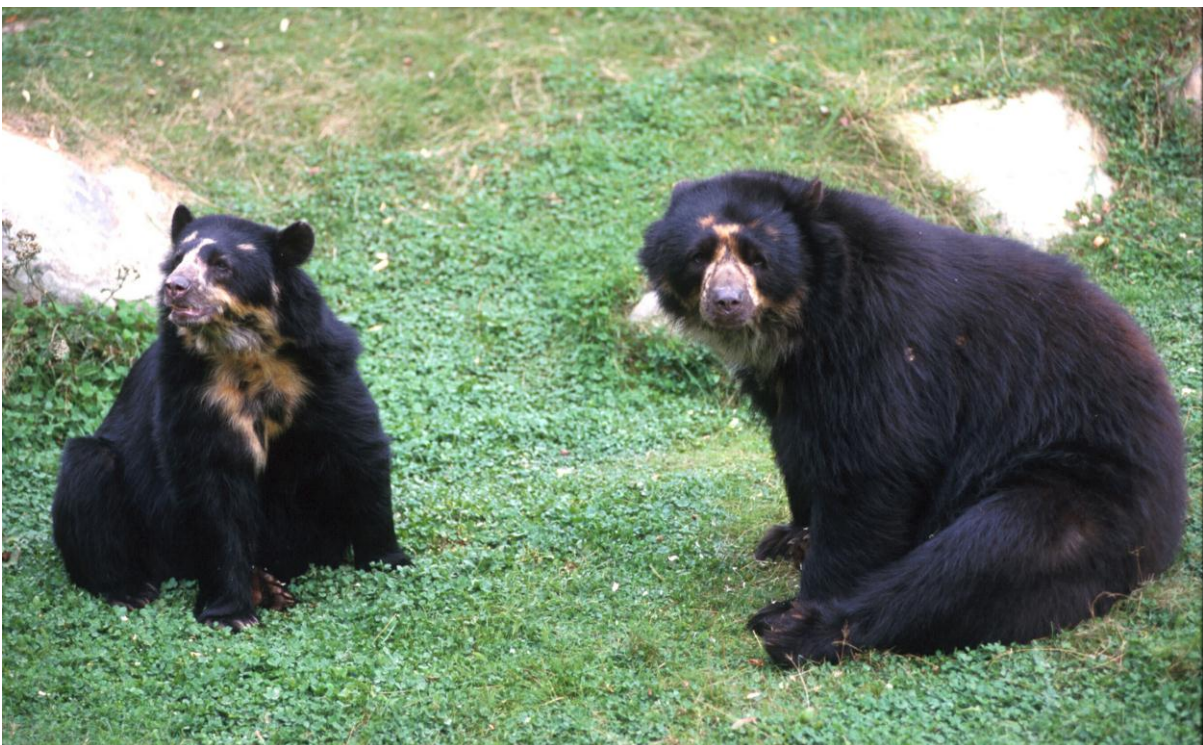


Map of Jewels of the Forest

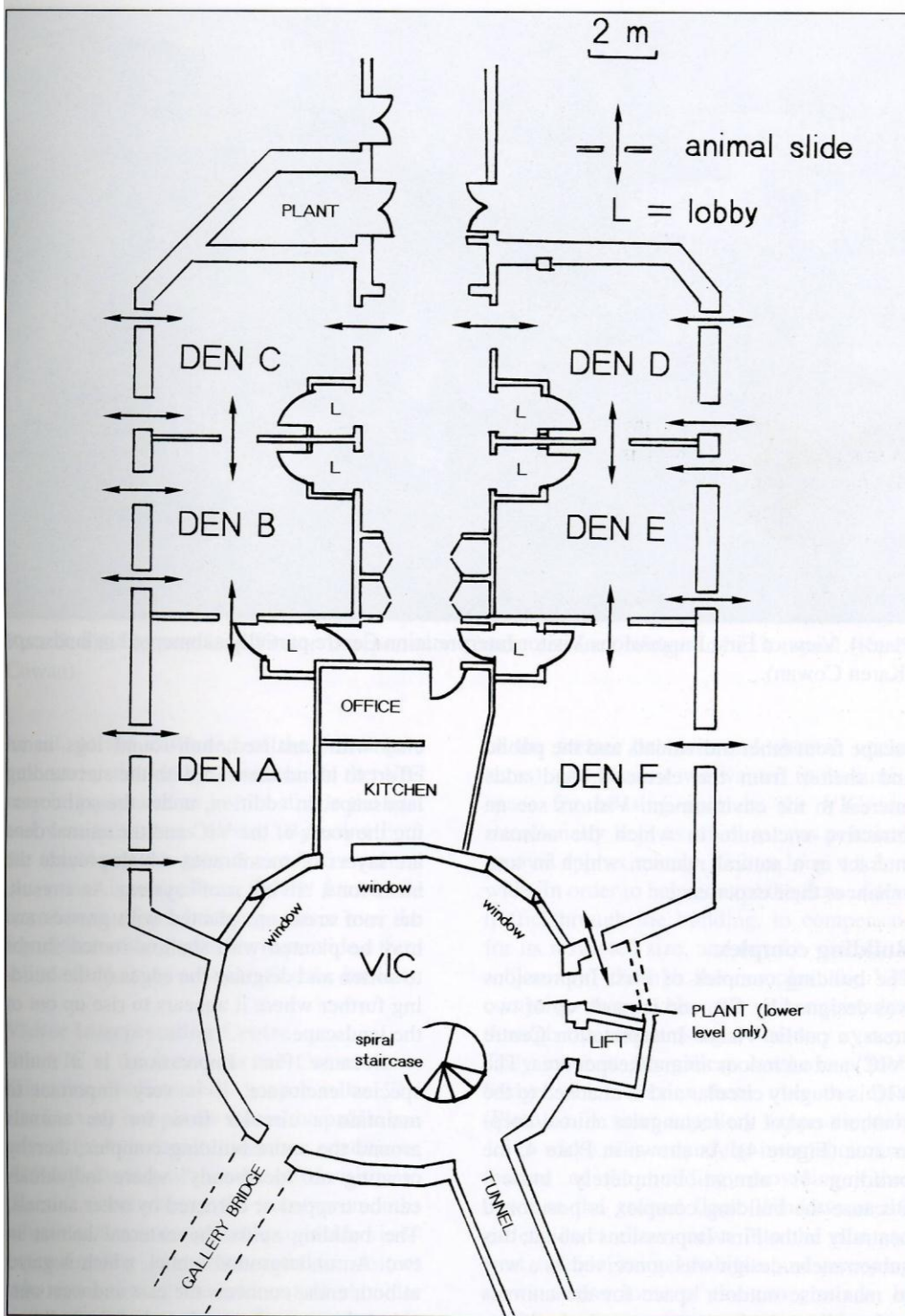
Zone 2: Andean bears and coatlis

Our Andean bears and coatlis are both from South America and can be found living high up in the mountains and the Andean mountain chain. Barbara and Wolfgang are the names of our bears, which have been with us for more than a decade. In that time they have had three sets of twins which have now grown up and our contributing to the captive population of this threatened species in other zoos around the world.

The Andean bear is the only bear living in South America. It is a relatively small bear enabling it to climb trees and reach the hearts of the bromeliad plants it favours as a food source. Unlike many other bears this species rarely eats meat, favouring a diet of wild fruits and plants. However, they are opportunistic and will eat the carcasses of dead livestock if they find them. This has given them a bad name with local farmers who kill the bears thinking it is them that are killing their livestock. One of the biggest threats they face is continued destruction of their forest home giving them smaller and smaller areas in which to live. The development of roads across its habitat means that the remaining forest becomes fragmented and therefore harder for the species to move around and find mates and suitable feeding grounds. We still do not have a good idea as to how many bears are left out in the wild but one estimate has suggested we've lost 30% of the population within the last 30 years. With perhaps only 5000 bears left in the wild this rate of loss poses a significant threat to the future of the species.



Wolfgang and Barbara, Durrell's Andean bears



Map of Zone with Andean bears and coatıs

Zone 3: Kirindy Forest

Kirindy forest is our Madagascar exhibit which has been built in the original walled garden, next to the Manor in the wildlife park. The zone is dedicated to the wildlife and people of Madagascar's dry west coast. The zone contains three species of



Ring-tailed lemur

lemur: the nocturnal aye-aye, ring-tailed lemur, and red-fronted brown lemur. There is also a walk-through aviary which supports unusual wetland birds such as the hammerkop, Madagascar teal and long-legged stilts. The zone also contains an enclosure for narrow-striped mongooses, a relative of the meerkat which is only found in Madagascar.

In the wild many of these animals can be found living in the dry forests of Menabe and the adjacent wetlands on the west coast of Madagascar.



This area is famous for its baobab trees that look like upside-down trees, with short, stumpy branches like roots and trunks which can grow to several metres wide. These trees are perfectly adapted to life in this arid part of the island, their trunks swelling to store water during the few months when it rains.

Only 3% of the remaining forest in this part of Madagascar remains, much of it being cut down for timber by the colonial powers in the 18th and 19th Century. More recently it has been cleared for agriculture as Madagascar's expanding human population try to carve out a livelihood. Durrell has been working in this part of Madagascar for more than 20 years, helping to get what remains of Menabe's dry forest protected and working with local communities to find sustainable ways of making a living off the land. We now run competitions in the villages bordering the forest, providing resources to help them improve their standards of living for those villages which are determined to protect the unique wildlife of the area. Most recently we have worked with the people living around Lake Bedo to get the lake protected as a Ramsar wetland of international importance. This status means that people can continue to use the lake's resources but only in ways that don't use them up.



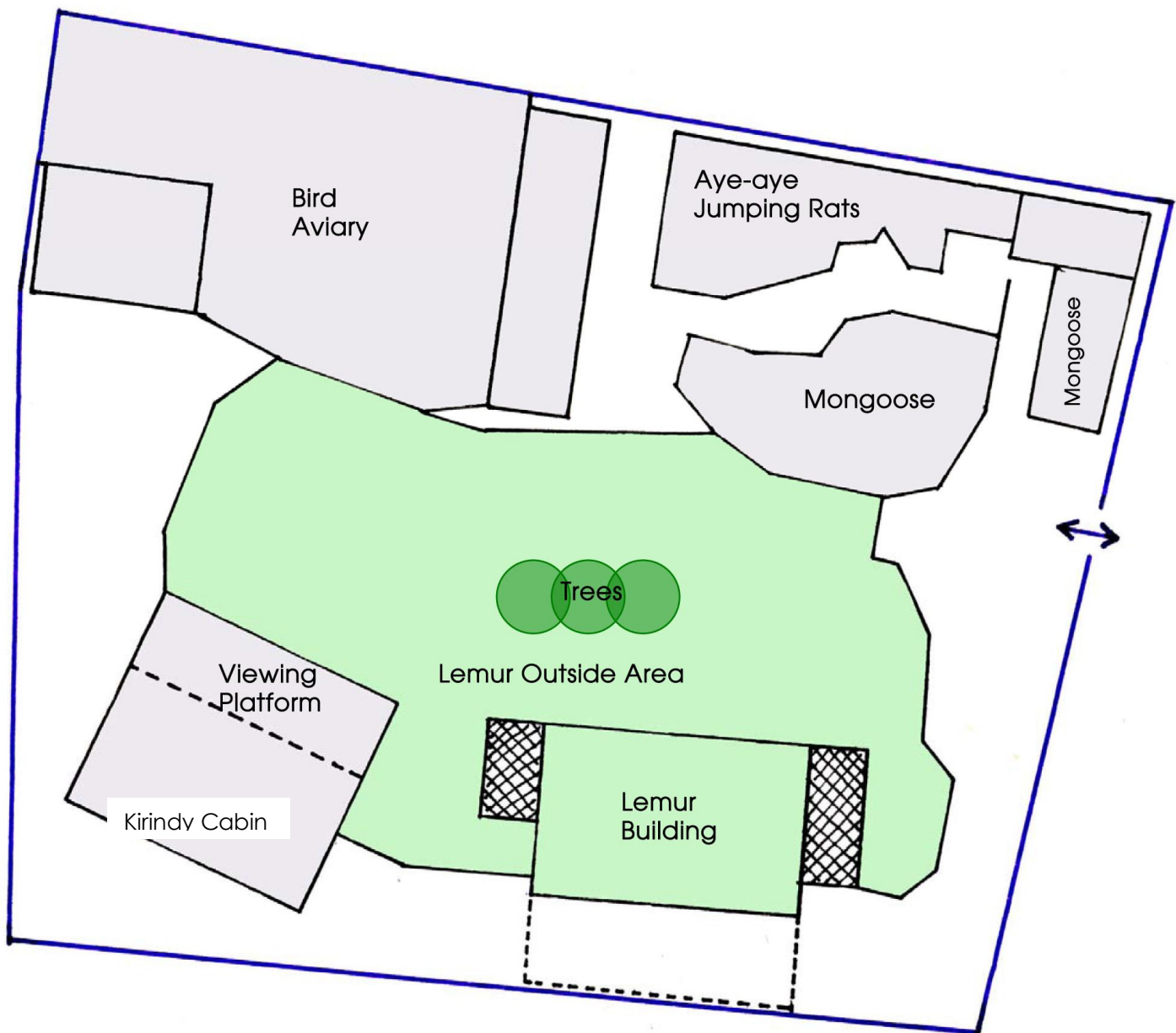
Narrow-striped mongoose living next to the ring-tailed lemur in Durrell Wildlife Park. In the wild it is only found in the dry forests around Kirindy in Madagascar.

Kirindy cabin was designed to provide a view of the animals from this region here at the wildlife park in Jersey. This wooden cabin was also made to create a dry,

sheltered space for visitors to make their experience more enjoyable. Currently there are some simple banners up in the cabin to explain how the lives of the people and wildlife of Kirindy are threatened largely due to habitat destruction. We have also used the space to sell local products made in Madagascar, supplementing the income of local people and raising a small amount of money for Durrell. However, the cabin is largely empty and is a good space to be used for educational materials or activities about Madagascar. It could be used to convey a message about the uniqueness of the island and the west coast in particular. Or it could focus on particular groups of animals like the lemurs to explain more about their unusual characteristics. The space could be used to bring alive the way of life for people in Madagascar and make connections between their lives and ours back in Jersey. Or there may be other messages which you may feel are more important to give.

What is a lemur?

Lemurs are a primitive group of primates (or monkeys) which are only found on Madagascar. There are currently 99 species of lemur living on the island, with a further 17 species which went extinct soon after humans arrived on the island. This included a species of lemur the size of a male gorilla. When Madagascar split from the African continent roughly 180 million years ago the ancestors of the lemurs were marooned on the island and were able to evolve over time in the absence of predators which had not yet developed. Free from being eaten, the lemurs were able to evolve into a variety of species, each one finding its own niche, or role within the ecosystem. Lemurs are different from other groups of monkey in having relatively small brains and relatively large noses! They rely on their sense of smell and sight to help keep them out of danger and to find food and each other. The ring tailed lemurs use their tails as marker flags to help other members of the same group keep in touch with one another.



Map of Kirindy Forest Zone

Zone 4: The Reptile and Amphibian House

The existing building contains more than 45 species of reptile and amphibian, many of which are threatened with extinction. The public viewing area covers approximately 50% of the building the remainder being where our off-show conservation breeding and research work is carried out. We are currently working on new educational signs to go up in the public viewing area, which will be completed by Christmas. However, the off-show part of the building remains an “unknown quantity” for the visiting public.



Lesser night gecko being bred at the Wildlife Park for release back to the wild in Mauritius

Behind the scenes we are working with species such as the Lesser night gecko from the islands off Mauritius. We are breeding up a population of this threatened species to be returned to the offshore islands of Mauritius to boost the population in the wild. Other projects include an emergency conservation initiative to save the Montserrat mountain chicken frog, on the island of Montserrat in the Caribbean. This frog, the size of a dinner plate, has been threatened with extinction through over-hunting by humans and by destruction of its rainforest habitat. Most recently a fungal disease (chytridiomycosis) was introduced to

Montserrat accidentally from one of the neighbouring islands. This disease is wiping out the frog which seems to have little resistance, driving the population down to critical levels. We bred the species for the first time in captivity almost 10 years ago, giving us the skills we needed to turn the species around should we need to do a full-blown captive breeding programme. That time is now. We saved 50 frogs from the wild in 2009 and, working with two other zoos in Europe we are breeding a large captive population to be released back into the wild when and where it is safe to do so. We have identified an area in Montserrat to conduct a trial release of the frogs we have bred so far to ensure we can perfect the method. We are planning for these frogs to go back to the wild in Montserrat in December this year.

We also have two shipping containers situated outside the building which have been designed to create the perfect conditions for breeding some of our more sensitive and high priority species. For example one of the containers contains thousands of agile frog tadpoles each year which we help to grow into small frogs before being released down at Ouaisne Common, to help support the small local agile frog population on Jersey. We are now seeing the results of this conservation work with frogs returning to the ponds which originally came from our captive breeding facility. Next year we plan to bring in the unusual frog called the Lake Titicaca frog (from Bolivia). This frog is threatened with extinction from overhunting, pollution in the lake and the potential risk of disease which could wipe out the species in the wild. We will work with a Bolivian conservationist who will be based in Jersey for four months to work out how to breed this unique species, so he can set up captive populations in case the species in the wild goes extinct.

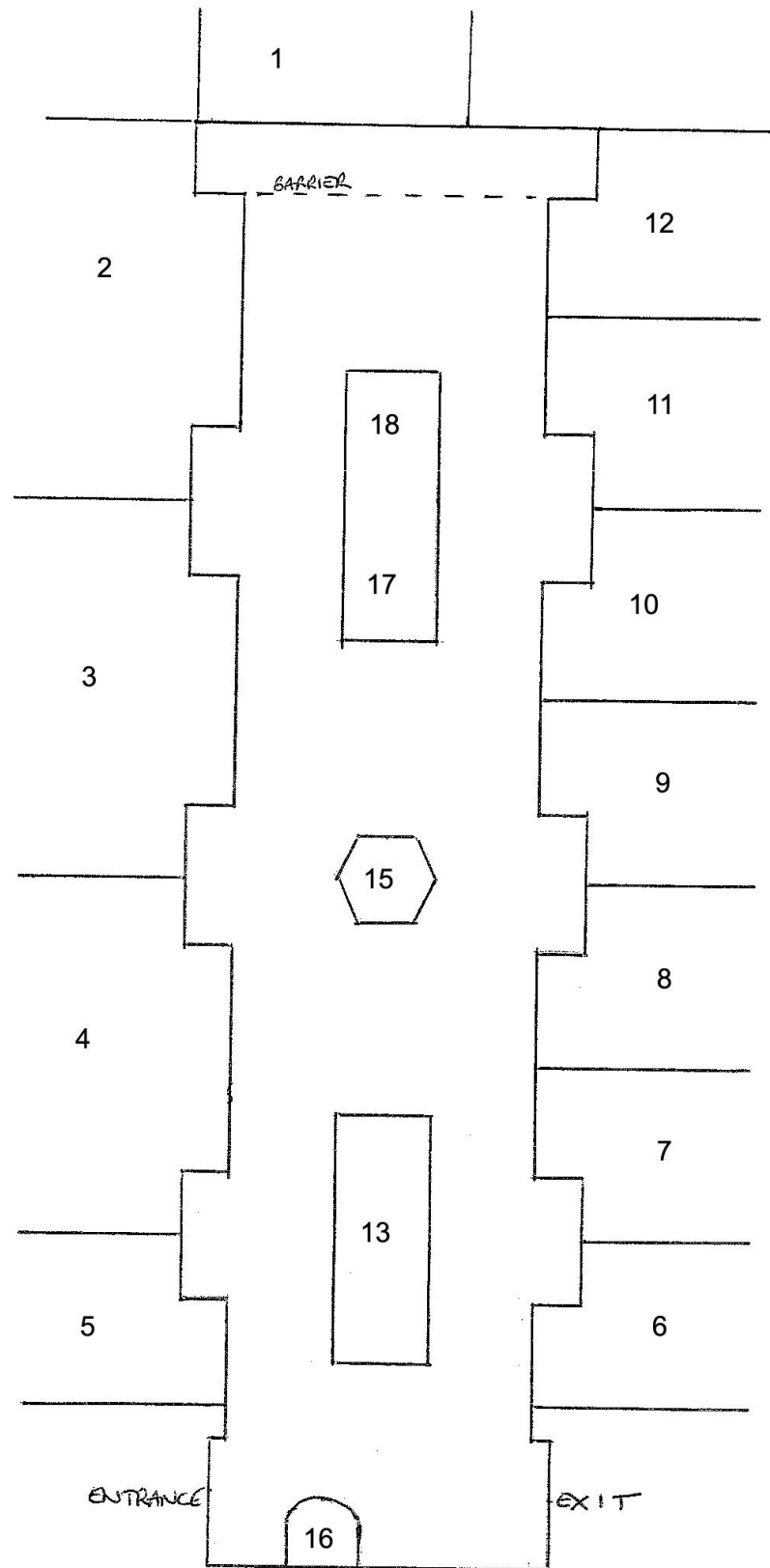
The two key areas then which require further messaging in and around the amphibian and Reptile and Amphibian House are therefore the off-show areas and the shipping containers which now act as new breeding rooms for our threatened species. One question you may want to answer if you decided as a group to make this a priority area for interpretation is *how do we make the public aware of what is going on behind the scenes?*

What's a reptile or amphibian?

Reptiles and amphibians are animals with backbones which are cold-blooded. This doesn't mean they necessarily feel cold (they can actually become quite hot!) but that they cannot control their own body temperature like we (mammals) can. They don't shiver to make their own heat when they're too cold or sweat to cool down as we do. They rely on the heat from the sun to warm themselves up and will look for shade to cool themselves down. Until the 19th Century reptiles and amphibians were believed to be similar groups of animals. We now know they are very different.

One important difference between reptiles and amphibians is that while reptiles are all covered in bony plates or hard scales and many have claws, amphibians don't. Instead they have soft, often moist skin and they lack claws. Another important difference is that reptiles lay eggs which have a hard or leathery shell, while amphibians lay eggs without any protective covering at all. This means amphibians have to find somewhere cool and damp to lay their eggs so they don't dry out. Finally while young reptiles will look like smaller versions of the adult, many amphibians have completely different life stages (e.g. tadpoles and adult frogs), living in different sorts of habitat, so adults and young look very different.

There are more than 6000 species of amphibian and an estimated 9000 species of reptile in the world today. The reptiles include tortoises, turtles, snakes, lizards, alligators and crocodiles. They vary in size from the smallest gecko (a type of lizard) at 1.6cm to the saltwater crocodile measuring over 6m in length and weighing over 1000kg! Amphibians are made up of three groups of animals: the frogs and toads; the salamanders and newts; and the caecilians. Caecilians are legless amphibians which look a cross between a snake and a worm and live in tropical countries under ground or in freshwater.



Map of the Reptile and Amphibian House (area currently 'on show')

Final Thoughts – Durrell Conservation Activities

One area of Durrell's international efforts which currently does not receive much coverage around the park is the work of the International Training Centre (ITC). The ITC was established in 1985 at the Les Noyers Manor, across the car park from the wildlife park. Gerald Durrell set up the centre to help train conservationists from around the world so they could then conserve their own species and habitats. Since this time we have trained more than 2700 conservationists from more than 128 countries. We run courses at the centre throughout the year, bringing in students and professionals from across the world to learn new skills. We also take our courses overseas, ensuring that we can reach those individuals without the time or resources to come to Jersey. We now run courses throughout the Pacific islands, Caribbean and Indian Oceans as well as in continental areas as far apart as Bolivia and India.

If we are to secure the survival of many of the species on the planet then we must ensure the next generation grows up to care. The ITC provides conservation education classes to more than 3500 local school children every year and runs residential courses for schools from other channel islands, the UK and France. We now offer introductory conservation courses for adults with an interest in wildlife conservation, giving them behind the scenes access to the world of endangered species and habitat conservation.

While we are bombarded with messages in our everyday life about how the future of the planet may not be bright, here at Durrell we feel that there is reason to be hopeful. Species and habitats have been saved from extinction through the tireless work of individuals determined to make the world a better place. By working with local communities, training local conservationists and protecting species on the edge of extinction we can show that we can shape a more positive world in which the next generation can enjoy as much of the beauty of the planet as we are fortunate enough still to be able to do. However, this message is currently not being fully conveyed around the wildlife park. This is something we would like you to consider as you decide what message is the right message to give in order to better engage our diverse visiting public in 2011.

Appendix 3 – Zone Ranking Handout**Ranking the Educational Opportunity Zones**

Please complete the 'criteria' list below by filling in the blank spaces with the criteria agreed in our previous discussion.

Indicate whether you think the zone is 'very poor' to 'very good' on this criterion:

'Jewels of the Forest' (Birds)

Criterion 1: _____

Very Poor 1 2 3 4 5 *Very Good*

Criterion 2: _____

Very Poor 1 2 3 4 5 *Very Good*

Criterion 3: _____

Very Poor 1 2 3 4 5 *Very Good*

'Kirindy Forest' (Lemurs, Aviary, Striped Mongoose)

Criterion 1: _____

Very Poor 1 2 3 4 5 *Very Good*

Criterion 2: _____

Very Poor 1 2 3 4 5 *Very Good*

Criterion 3: _____

Very Poor 1 2 3 4 5 *Very Good*



Please turn this sheet over to rank the final two zones!

'Andean Bears and Coatis' (also Rodrigues fruit bats)

Criterion 1: _____

Very Poor 1 2 3 4 5 *Very Good*

Criterion 2: _____

Very Poor 1 2 3 4 5 *Very Good*

Criterion 3: _____

Very Poor 1 2 3 4 5 *Very Good*

'The Reptile and Amphibian House' (Gecko, Frog, Tortoises)

Criterion 1: _____

Very Poor 1 2 3 4 5 *Very Good*

Criterion 2: _____

Very Poor 1 2 3 4 5 *Very Good*

Criterion 3: _____

Very Poor 1 2 3 4 5 *Very Good*

Appendix 4 - 'Tip sheet' for focussed activity

Developing a specific action plan: Issues to consider

As you are developing your specific education or information action plan for your selected zone, you may want to consider the following factors:

What is your core message(s)? (what ideas do you most want to get across to visitors?)

What senses are you focusing on? (sight, touch, smell, hearing, taste)

What is the target audience(s) for your activity or educational materials? (e.g. parents, children, young adults, etc.)

Why will your new activity be interesting, useful or relevant to visitors?

Where specifically within the zone would you like to focus your message(s)?

What medium are you using to deliver your message(s)? (e.g. sign, video, audio, member of staff, leaflet, website, iPhone app., mobile phone, webcam, podcast, etc.)

How does your message(s) and medium connect to the animals in this zone?

Is there a connection to at least one of the key themes (biodiversity, invasive species, ecological connectivity, endangered species)?

What is your new activity aiming to achieve? (how will you know whether this new activity has been a success?)

How can you ensure that everyone will be able to access your activity or material?

Does your activity take place entirely within the zone, or does there need to be additional signs or other information provided elsewhere in the wildlife park?

Is your activity limited to the duration of the wildlife park visit, or will there be parts of the activity or materials that are used before or after the visit?

Are there issues that you do not want to be discussed during your activity, visitors that you are not targeting with this activity, or parts of the selected zone that would be particularly unsuitable for your new educational activity or materials?

What kind of resources will be needed to create this new educational activity? (financial, staff time, etc.)

*If you still have time, what specific words or images would you suggest for your new educational activity or materials? (can you draw us some labelled pictures of what you have in mind?)

Appendix 5: Post-PPM Evaluation Feedback (Anonymised)

M2 “I will be changing when I go back [after the PPM]. I’m going to change one of my charities and I’m going to switch it to here because I’m just thinking one of the things I’ve got isn’t actually going the way it should go. This is what I believe in”.

PPM Group 3

What did you think of the PPM event?	Additional Comments?
Very interesting and I hope productive.	[Our facilitator’s] presence on our table was very good. The scoring of the zone areas could have been explained better. On the whole I thought it worked very well.
Excellent. Good range of experiences, backgrounds, and views in our group.	Choosing exhibit by choosing criteria first [worked especially well]. How to get less vocal people in group heard? [could be improved]
Good. I hope that action will definitely occur.	The relevance of the educational theory lecture was lost on me.
Very good. Well organized. Interesting and informative. Glad we came.	Poor writing. I am registered blind.
It was most enlightening and interesting. I now understand more the importance of diversity. Excellent time-keeping throughout.	Everything was excellently well planned. Thanks for the tasty lunch and refreshments. We enjoyed a good 'holiday' day!
Very informative.	N/A.

Very informative, and efficiently run.	After zone is chosen -- may be helpful to go and look again to see areas that could be improved.
It was great and educational.	No.
Good.	[Could be improved:] Time to consider; to take info away then bring back with ideas. I.E. One workshop to introduce ideas. Then another in a week to gather ideas.
Very interesting and informing.	It was well organized and time taken to discuss topics was well thought out.
It was very informative and interesting.	The tour was very helpful.
Very informative, worthwhile experience.	N/A
Enjoyable, productive, informative, think some good ideas have come out of it.	Good. Small group then coming back together for group chats well managed. Enjoyed hearing more about the work of Durrell.
A good experience as the organization show they are willing to listen and	The group discussions and the openness of the workshop.

communicate with the general public.	
A very good idea to get the public involved to not only gain interest but to increase knowledge and involvement in Durrell's work which is vital for the conservation of its work.	More people involved.
I appreciate the need for consultation but it is not my learning style.	Enjoyed the behind the scenes tour and meeting keepers/education officers and Jamie, etc.
N/A	N/A
Extremely interesting and a great deal of knowledge was given.	The improvement of the Reptile and Amphibian House we thought was very necessary because so much information was there waiting to be inspected.
Too bureaucratic	Less form filling. Spent all day on a decision any businessman could have made within 10 minutes of identifying the problem

Figure 7: ‘Nature through Human Eyes’ Painting by Lisa Sayles



Endnotes

ⁱ The zoo could provide some of these talks as an evening lecture series once a fortnight in the Princess Pavilion, with lights to get there from the entrance and a small fee, plus a short visit to the animal(s) that the talk is about (e.g. £5 per person suggested donation).